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ABSTRACT

This review and synthesis of health occupations education is aimed at those who plan, implement, and evaluate health occupations education: those who seek clarification on the issues in this area: those who wish to identify research topics or plan replication studies; and those who seek information on curriculum development, materials, and methods. The first section, philosophy, discusses organizational change and health care systems. The second section, human resources, covers aspects of data collection, and internal and external forces that affect the problem. Section 3, program planning and administration, examines the use of surveys in obtaining data and performance of compentencies. Section 4, curriculum development, includes task analysis, objectives, and examples of curriculum guides. Section 5, curriculum materials, discusses sources of materials and printed and audiovisual materials. Section 6, the learning process and strategies, covers unique learners and specific strategies. Section 7, continuing teacher education, examines the need for continuing education and the role of professional organizations. Section 8, evaluation, includes formative assessments and summative evaluation. Section 9, student services, discusses student characteristics and admissions. Section 10, career education, ccvers career awareness and exploration. Finally, section 11 discusses observations and recommendations concerning crganizational change, role recognitior and legitimation, and program development. (CT)

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HEALTH OCCUPATIONS EDUCATION: A REVIEW OF THE LITERATURE

by

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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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FOREWORD

The Educational Resources Information Center on Adult, Career, and Vocational Education (ERIC/ACVE) is one of sixteen clearinghouses in a nationwide information system that is funded by the National Institute of Education. One of the functions of the Clearinghouse is to interpret the literature that is entered in the ERIC data base. This paper should be of particular interest to researchers and practitioners in the field of health occupations education.

The profession is indebted to Dr. Wilma Gillespie and Dr. Jeanette Redford for their scholarship in the preparation of this paper. Recognition also is due Mildred Pittman, Texas Woman's University; Catherine Junge, Pittsburg State University; and Janice T. Adkins, The National Center for Research in Vocational Education, for their critical review of the manuscript prior to its final revision and publication. Robert D. Bhaerman, Assistant Director for Career Education at the ERIC Clearinghouse on Adult, Career, and Vocational Education, coordinated the publication's development.

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This review and synthesis of health occupations education is aimed at those who plan, implement, and evaluate health occupations education; those who seek clarification on the issues in this area; those who wish to identify research topics or plan replication studies; and those who seek information on curriculum development, materials, and methods. The first section, philosophy, discusses organizational change and health care systems. The second section, human resources, covers aspects of data collection, and internal and external forces that affect the problem. Section 3, program planning and administration, examines the use of surveys in obtaining data and performance of competencies. Section 4, curriculum development, includes task analysis, objectives, and examples of curriculum guides. Section 5, curriculum materials, discusses sources of materials and printed and audiovisual materials. Section 6, the learning process and strategies, covers unique learners and specific strategies. Section 7, continuing teacher education, examines the need for continuing education and the role of professional organizations. Section 8, evaluation, includes formative assessments and summative evaluation. Section 9, student services, discusses student characteristics and admissions. Section 10, career education, covers career awareness and exploration. Finally, section 11 discusses observations and recommendations concerning organizational change, role recognition and legitimation, and program development. (CT)

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INTRODUCTION

The first edition of the Review and Synthesis of Research in Health Occupations Education (1969) was authored by Lewis D. Holloway and Elizabeth E. Kerr, both of whom were involved in the health occupations education program at The University of Iowa. These authors obtained materials from the usual sources such as Dissertation Abstracts, Master's Theses in Education, Nursing Research, the Educational Resources Information Center (ERIC), and library sources. Additional resources included professionals who responded with over 200 letters from governmental agencies, universities, schools, and organizations.

During the period since the first edition, new societal needs have affected vocational education, in general, and health occupations education, in particular. Responses to these changes were reflected in the amount of information and the number of studies available. Therefore, some decisions were necessary in order to delimit the number of studies reflected on in this paper. The selection criteria used were - whether a document was available in the ERIC system, whether it pertained to health occupations education at the baccalaureate level or below in all areas except nursing (studies at the baccalaureate level and above in nursing were excluded), whether it had been published after 1969, and whether it had been written in this country.

The authors recognize that these criteria excluded some items of importance which were not identified in the sources utilized. However, we assume full responsibility for - (a) excluding some reports generated by an ERIC search, (b) including studies which may not have had a sophisticated research base but which had significant implications, and (c) including some studies with a publication date prior to 1969 but which were not included in the first edition.

The topics are presented with a focus on issues which resulted from a review of the abstracts, research, and extensive discussion between the coauthors. We hope this report will be useful for those who plan, implement, and evaluate health occupations education; for those who seek clarification on the issues in this area; for those who wish to identify research topics or plan replication studies; and for those who seek information on curriculum development, materials, and methods.

PHILOSOPHY

INTRODUCTION

Health occupations education during the period from 1969 to 1979 was greatly affected by change. It was influenced by legislation, such as the Health Professional Educational Assistance Act of 1976 and legislation for youth with special needs; and such trends as competency-based education, performance-based teacher education, metric education, and consumerism in health care.

The health act of 1976 contained elements for change to meet such national needs as providing more primary care practitioners and improving health services in shortage areas. Section 1123 of the act provided for the establishment of qualifications for health personnel under the Medicare program. Methods were developed to determine the proficiency of individuals who did not otherwise meet formal requirements for performing the duties of various types of health care. This obviously had implications on the philosophy of health care, as well as organizational change, role legitimation and recognition, and program development (Smith, 1971).

ORGANIZATIONAL CHANGE

Anderson (1970) identified several obstacles to change, namely, excessive demands due to expectations of citizens, too few resources to develop programs, isolation and division, poor management, and excessive traditionalism. Milliken, in reporting the proceedings of a conference (1976) which dealt with a number of aspects of change, described similar obstacles.

Frey (1973) described health care as a social as well as a scientific process and described several changes which affect health care. They included - increased usage of health care services; such scientific and technological changes as the possibilities of radiant energy, ultra sound, thermography, and computer assisted diagnosis; changes in delivery systems; and changes in quality control from the present system of program accreditation and personnel licensure to institutional licensure. Both Pifer (1970) and Frey (1973) explored issues of consumerism in health care and patient advocacy in equal access for health maintenance. Spencer (1976) also explored these issues.

HEALTH CARE SYSTEMS

The "sick-care" system of health care has a physician-dominant mode in relation to decision making and prescribing care. Frey (1973), in describing the systems of "well-care" and "sick-care," saw the physician as holding a position of "cross over" between the two. Pifer (1970), in describing changes in health care delivery, indicated several changes in the role of physicians, including a breakdown in their professional authority. Pifer further suggested that a new health care system would evolve which would be based on the following assumptions: Every citizen would have guaranteed access to adequate medical care. Substantial appropriation would be provided by the federal government. The health care system would promote the self-responsibility for health care. The system would be oriented to the prevention of disease rather than the treatment of illness.

Support Personnel

Kuritsky and Ruder (1971), Collins and Bonnyman (1971), The Bureau of Health Manpower (1972), and Perry (1971) each described the roles of the personnel to whom physicians were willing to delegate specific tasks. Physician assistants and nurses with the expanded roles of nurse associates or nurse practitioners also were described.

Nursing Controversy

During the 1970s, planners of associate degree nursing programs sought a legitimate place in higher education, while practitioners sought role recognition from employers. Zorn (1974) described the historical factors which influenced the growth of associate degree nursing programs and the changes in duties being assigned to nurses. Blackstone (1974) studied current trends in associate degree nursing programs and compiled data on ten associate degree nursing programs in six states. The findings indicated that the curriculum combined nursing courses and supportive college courses; costs, admission policies, and living arrangements for nursing students were comparable to those for students in other curricula; students were prepared for state licensure examinations for registered nurses; and program length varied from two academic to two calendar years.

Another source of controversy involved efforts to determine standards for the entry level of practice. The attempts in New York to legislate changes in standards for entry into practice, initiated by the New York State Nurses Association, were described by Koch and Lenburg (1977).

Torres (1974), in describing the roles for the professional nurse, observed that role denoted a person's title or position, while functions identified what the person was doing. She implored educators who play a key role as change agents to look at functions as they evolve in response to society's demands for health care. Some of the evolving functions were data gathering, nursing diagnosis, nursing intervention, evaluation, and administration.

THE CHANGE PROCESS AND PROGRAM DEVELOPMENT

Credentialing: Quality Control Process

Falger, Astin, and Boger (1970) noted that "too often, projections tend to confuse demand (the number of jobs that can be financed with current or future funds) with the need (the number of persons in a field who will be required to produce a given level or amount of service judged to be desirable). The distinction is between social ideals - what people feel ought to be done - and economic realities - what people are able to pay for" (p. 29).

Light (1970) explored the need for job analysis of an entire specialty or functional area when developing assistant categories, the questions to be asked when planning and constructing a new curriculum, and the separate and joint responsibilities of the educational and medical spheres in the development of new fields. In addition, Strong (1972) described the dilemma for administrators in program development in allied health as deciding - which agencies could be asked for help, information, funds or whatever; which agencies must be asked for permission to even consider a program; and which agencies must be involved if faculty are to be approved.

The issue of credentialing as a quality control was discussed by both Young (1977) and by Frey (1973). The latter, in indicating that quality is now controlled by credentialing, licensure, and educational accreditation, noted that there is increased questioning about the effectiveness of personnel credentialing as the best safeguard of good patient care. Frey also wrote that there is a general dissatisfaction with "a terrible disease of infectious credentialities," but that the cures include open universities, credit for prior learning, and so on. This will have a profound effect on the health fields.

Kelly (1977) also looked at the issue of credentialing mechanisms for nurses and other health professionals.

Teachers in allied health belong to two social systems - education and health care delivery - and are affected by credentialing in both. Freeman et al. (1975) pointed out that the instructor has been transformed from a dispenser of discrete parcels of knowledge to a manager of the learning environment. The student, in turn, has been converted from a passive recipient to an active seeker of knowledge.

The legal implications of competency-based teacher education were the subject of a report by the Study Commission on Undergraduate Education and the Education of Teachers (1976). Teacher licensing was seen as a tool through which the state exercised its control powers and accrediting agencies described themselves as protective agencies.

Nontraditional Studies

Various program changes have been reported in relation to social relevance, shortened curriculum, and other curriculum focuses. Heaney (1975) discussed societal usefulness and cost effectiveness, justifiable professional boundaries, and other concerns related to interdisciplinary integration of health professions education. The related development of meaningful equivalency and proficiency examinations in appropriate categories of health personnel for entry into education programs and occupational positions was reported by the Department of Health Education and Welfare (1970). The shortened curriculum in professional schools was the subject of a study by tke Southern Regional Education Board (1974) as well as by Schoen (1972).

Several researchers reported projects to extend educational opportunities to various target groups. For example, advanced standing was described for practical nurses by Richardson (1974), for the medical laboratory technicians by Linehan (1970) and the National Committee for Careers in Medical Technology (1974), and for nurses by Kirkwood Community College (1976). Target groups such as migrants were described by Jones and Gisler (1973), inactive nurses were reported by Altman (1971), inactive health personnel were described by Schiavone (1969), and the disadvantaged were reported by Hatch (1972). Also, The New York Regents external degree program was described by Nolan (1977).

Consumerism in Health Care

In describing the "sick-care" and "well-care" system of the future, Frey (1973) cited the need for patient advocates, for people to guide others through an illness or a health system, and for health educators who will assist people in maintaining health. Johnson (1973) described client-mediated care. Pifer (1970) described consumer advocacy for access to medicare

care. Ross (1976) also cited the need for health education to include training in patient education and consumer advocacy. Tastler et al. (1976) discussed the components of quality health care and suggested ways for consumers to find and avail themselves to the best care possible.

HUMAN RESOURCES

INTRODUCTION

As the 1960s came to a close, a major problem in health care was the apparent insufficiency of trained workers. This general problem continued through the 1970s as well. It still appears that the problem of adequate health care personnel is connected with numbers. However, closer examination reveals that the problem is related to many complex and related variables. It is clear that the criteria for determining personnel needs for providing health care services are too complex to be summarized by mathematical calculations. The survey of literature indicated some of these problems affecting how we utilize human resources in providing health care. We will attempt to view personnel needs in relation to the research cited and to report steps which might be taken toward a definitive solution of the problem. The basic question appears to be whether we need more people or better organization of the system.

The 1970s witnessed the investigation of many factors in an attempt to determine human resources needs. Data collection was most prevalent which aimed at determining the present number of employees, existing vacancies, new job openings, and employee turn-over. A major problem was the lack of data uniformity, making interpretation extremely difficult. It appears that a connection exists between the concept of valuing adequate health care for all citizens and the maldistribution of health care workers. This connection was particularly evident in health services provided to residents of rural and inner-city areas, because these two groups are obviously ill served. This is one example of responsibility being placed on numbers of workers in lieu of a discussion of more effective utilization of existing workers. The question is whether the system lacks personnel to provide health care to the populations of rural or inner-city areas, or, whether those employed select to work in other locations.

Another issue is whether health personnel are specifically trained for job functions or whether the functions are realistic to the health care needs of the public. The recurring suggestion that health workers spend time performing functions for which they are overtrained is one problem. Another is the limited opportunity for upward mobility and the accompanying salary increases, causing many individuals to seek employment in other fields. Still another issue is whether individuals employed in other areas might not do well to be incorporated into the health care delivery system.

ASPECTS OF DATA COLLECTION

It was not surprising that the lack of adequate numbers of health care workers received so much attention. Haddard (1978) indicated that the great need for health care workers was due to the combined impact of Medicare and Medicaid legislation, new health care technologies, the widespread utilization of private medical insurance, and the increased accessibility to medical care facilities. The Texas State Office of Comprehensive Health Planning (1970) issued a warning against undue emphasis on health resource shortages. It cautioned that such emphasis might be the greatest negative factor in the delivery of adequate health care. If we assume that limited progress was made during the 1960s on improving the health care system, it would appear that the warnings emerging from the Texas report were not without validity in that a limited focus on the complexity of the problem has produced few meaningful results.

A more in-depth review of selected studies (Coastal Bend, 1973; Health, Education, and Welfare, 1974; Public Health Service, 1968) dealt with the use of selected data for determining the number of health care workers needed. Each of the studies cited, however, indicated the importance of measuring the supply of workers and where one might secure appropriate statistical data. The Coastal Bend study provided a list of five practical steps for health personnel planning with emphasis on probable solutions rather than projecting an idealized situation. The study suggested establishing priorities through comprehensive planning on local and/or regional levels. This suggestion is extremely relevant in that it moves from the consideration of numbers toward focusing on the total issue.

In the Health, Education, and Welfare study (1974), the role of the Division of Manpower Intelligence was discussed in terms of providing information and analysis that might be used in developing alternative strategies for educating health personnel. The report highlighted significant gaps in the information we have and in available data. Valuable assistance concerning long-range data collection, analysis, and research efforts to assist in comprehension of the dynamics of health personnel resources emerged from the study. It is particularly significant that the study identified five factors which hinder adequate data-gathering for allied health occupations. Like the Coastal Bend study, this study indicated a moving away from the "numbers" issue.

The Lutheran Medical Center (1979) designed a training model for allied health personnel. It provided three approaches for assessing needs for health workers. The first approach (the one most often used) was to record the number of basic workers

currently employed, existing vacancies, needed replacements, and projected expansion. The second approach noted the demographic make-up of a community and the level of its health care as compared to national norms. The third approach was to depict the ideal health delivery system and to identify the personnel required to operate it effectively. While somewhat esoteric, the model indicated other efforts to move away from a statement of the problem of adequate health care in terms solely of the number of workers.

In keeping with the theme of one approach used by the Lutheran Medical Center, DeSpain (1969) surveyed Oklahoma businesses in an attempt to collect occupational data for present and future needs. The data gathered relevant to occupational trends included twenty-two medical occupations and twenty-seven other jobs found within medical facilities. Apart from the data, two relevant questions emerged from this study: Are projections made by employers in the health care industry viable? Are there tendencies to depict results favorable to special interest groups in this type of procedure for projecting personnel needs?

The National Institute of Health (1969) compiled statistics on the supply and education of health workers in various occupations, including eight allied health fields. Data was organized by each occupation including the ratio of personnel per population for each state. Assuming the mechanics of the study were objective, such an approach might be very helpful in assessing health personnel needs in the future.

Solomon (1969) studied all hospitals, nursing homes, clinics, home nursing, and ambulance services in New York State to determine projected needs for thirty-nine specific occupations including nurses, technicians, and aides. In only ten of the thirty-nine occupations did the output equal the projected need. For the other occupations in the study, the demand was projected to exceed the supply by a total of 26,000 workers. Such a discrepancy indicates that the procedures used to draw these conclusions require analysis.

Bounds (1977) conducted a study to determine the future job market for twelve health technology occupations at the community level. Major employers were interviewed; others were surveyed by mail. The data were concerned with the present number of workers by occupation, the number of certified employees, the average length of time of occupational vacancies and an assessment of the supply for trained health care workers. This study provided relevant data only to the extent that those providing the conclusions are consistent in defining and interpreting the information requested.

A review of selected literature of human resource needs in the health care system was compiled by Northeastern University (1977). The review indicated that data gathered at the national level were not particularly useful in analyzing supply-demand relationships. Since the United States represents a series of local markets, the most meaningful data would be those concerned with local needs and services. Too often the single-issue need of additional health workers is given top priority as a means to improve the health care system itself. The demand for such personnel increases at a high cost to the consumer with negligible results is an ineffective, if not distorted, approach. In this regard, there is sufficient research to indicate that our problem (once defined) might be solved by increased attention to preventive health care. Changes in life styles and environmental conditions have been shown to have a more direct effect on health and well-being than increases in the health worker/population ratio. It is evident that certain approaches to data gathering relevant to health manpower have received minimum attention. Resistance to these approaches might result from resistance to the suggestion that basic changes in the health care system are in order. Vogt (1975) suggested that human resource needs should be determined by an identification of the number of employees with particular competencies required to provide given levels of health care in specific settings. Such approaches seldom appear to be followed.

The proceedings of the Health Manpower Planning Conference (1971) provided several possible solutions to these problems. One relevant issue was using data already available compared to the determination of data which should be collected. Nine categories of information required to support a planning process were listed. They indicate a departure from the type of statistical data usually collected through studies aimed at determining health personnel needs. The suggestions included a deeper concern with the relevant types of health services needed at community levels, effective health services, and emphasis on indepth information relevant to the socioeconomic and demographic aspects of a community's plans for development.

Several studies (Lipson, 1974; National Commission on Community Health Services, 1967; National Committee for Careers in Medical Technology, 1967; Peterson and Kerr, 1972) have stressed the need for uniformity of definitions and interpretations. They have suggested that a central agency might assume responsibility for the development of a systematic approach to collecting and reporting national data. Several made recommendations relevant to human resource needs, indicating that collection of adequate and valid data is merely the first step toward establishing a more effective health care system. However, little concensus exists. The problem is difficult to define; nevertheless, it

seems certain that clarification is dependent upon some discussion of shortage of workers. Once this shortage has been identified, it is necessary to deal with the problem of overcoming such shortages. Klutch (1967) suggested two major approaches for alleviating personnel shortages in health occupations. The internal approach called for a redistribution of available personnel; the external approach called for using currently underutilized human resources, for example, women, the handicapped, and the undereducated. Both approaches have merit. The problem is with the definition of terms. What might redistribution imply? Are underutilized personnel sources desirable or even acceptable?

INTERNAL FORCES WHICH AFFECT THE PROBLEM

Even if sufficient numbers of trained personnel were available, trends indicate that there would likely be a shortage of personnel in certain settings, such as rural areas and inner cities. Maldistribution of health personnel becomes closely aligned with insufficient numbers of health care workers. Appel et al. (1977) attempted to determine labor market conditions and the need for mid-level health workers. Distribution problems were partially attributed to lack of information that potential employers received relevant to the prospective workers' ability and availability for employment. Sources of this misinformation would most likely be those responsible for training and/or job placement.

In a study by Greesbury and Kadish (1974), one of the major concerns related to maldistribution of health personnel was the fact that allied health workers were not geographically mobile. They lived and worked relatively close to the educational institutions from which they received their training. In this regard, Blayney et al. (1976) reported on efforts to more adequately distribute trained personnel and eliminate duplication of health occupation education program efforts through a Linkage Program. This program allowed for specialized health content to be taught within a medical center setting in coordination with general degree requirements completed at a junior college. Near the end of the specialized health occupations training, students were placed in clinical sites near their home towns (often in rural areas) on the assumption that they would seek employment there. The assumption proved true - and was replicated in other states.

Warner (1975) reported various projects aimed at investigating ways to interest students in practicing in "shortage areas" such as inner cities or rural locations. A project in Kentucky used a college-level work study program to place health-oriented

students in summer placements off-campus. A similar project in Maine established clinical field experiences through the use of preceptors in rural areas. A project in New Orleans aimed at distributing health workers in the core of the inner city area used a multidisciplinary field placement approach. In each of the instances, there was a degree of success in addressing the problem of maldistribution of health personnel. These projects indicated that there was a greater likelihood of students seeking employment in an area with which they are familiar, and that projects which familiarize with specific need areas are successful.

A Task Force in the Manpower Distribution Project of the National Health Council (1973) identified several possible solutions to the overall problem of maldistribution. Two of these suggestions - providing training within the area of need and recruiting personnel from areas of need - have been discussed elsewhere. Other solutions emerging from the report included providing financial incentives, encouraging personal contact by the community residents with prospective employees, and allowing public service jobs to fulfill an individual's obligation for military service.

Hatch (1972) defined two national goals as (1) making good quality health service readily available to every citizen and (2) making health occupations rewarding careers for health workers. If these goals are used as criteria to determine the severity of the maldistribution problem, many local areas would rate extremely low. This would be true particularly if quality health services were interpreted to include preventive and routine medical health care. If health occupations are to be rewarding careers, a great deal will depend on working conditions and benefits.

According to a study conducted by the Administration On Aging (1975), health workers are more likely to be competitive with others in the job market and remain in the health field when they perceive that their wages, benefits, and hours are fair. According to the report, there are some areas of health care employment, such as nursing homes, in which turn-over rates result more from individuals leaving employment permanently than from seeking employment elsewhere. Quite likely, this is due to the age and background of the individuals employed.

A study by the United Community Services of Metropolitan Detroit (1970) investigated the shortage of health care personnel. Shortage was reported as a result of high attrition and turn-over rates among nurses, excessive mobility stemming from discrepancies in job compensation, and the increasing levels of specialization among practicing physicians.

Wittman et al. (1973), in examining the entry-level competencies required for selected allied health areas, concluded that salary level was the primary barrier for both initial employment and job retention for entry-level workers. Other barriers included lack of upward mobility, poor skills training, and lack of effective communication skills. A report by the American Medical Association (1972) concerning utilization of allied health personnel also concluded that the field must be made more financially attractive in order to encourage professional growth among such employees.

An economic research study compared the distribution of earnings of full-time year-round employed personnel in twenty large industries (Communications, 1970). The study reported the health industry to have an extraordinarily bi-modal distribution. The health industry, compared to other industries, had a higher percentage of employees at the very low end of the distribution - most likely allied health workers. Another observation was that the percentage earning more than twice the mean was 12 percent, compared to five percent for all industries. Such findings lead to questioning whether the distribution of personnel within the health industry is the result of physicians' desire to prevent the emergence of any close substitute for those services traditionally relegated to doctors or whether it is actually dictated by medical care technology.

In regard to working conditions, much attention has been given to the fact that health workers often spend too much time performing tasks for which they are overtrained. Mase (1975) reported that task analysis and cost accounting have indicated that many health professionals are overeducated for what they actually do. This situation could hinder job satisfaction and the overall effectiveness of the health care system. Similar findings have been reported by various branches of the military in analyzing poor work performance among officers and enlisted men. With relevance to nursing and allied health personnel, VanCleve (1975) designed a guidebook in using the job analysis technique to help decrease unnecessary overlap and increase worker productivity.

Other studies have indicated that the "so-called" traditional professionals might be reluctant to relinquish many job responsibilities that could be assumed by others in the health care field. Some suggest that the problem lies directly with tradition-bound "sacred cows." For example, a Virginia State Council of Higher Education study (1969) concerned with nursing shortage agreed with the notion that, compared to other professions, nursing has the unenviable distinction of a lack of concensus as to what constitutes the practice of its members.

Webster (1973), in reviewing the literature on the use of dental auxiliaries, found that dentists may increase the productivity of their offices by employing more auxiliaries and by delegating more tasks. However, it also indicated that dentists generally tended to resist any delegation of technical duties since they enjoyed performing these themselves.

Goldstein (1973) suggested that licensing requirements and education or training prerequisites for various occupations were arbitrary and unnecessarily high for the duties involved. Applicants who were competent to perform the work were turned away; allied health workers were not efficiently utilized. Registered nurses spent 25 percent of their time in functions someone else could do. With these findings, one can expect lack of motivation and feelings of dissatisfaction among health care workers.

With the vast increase of different job classifications in allied health, it becomes increasingly difficult to determine who best can perform particular tasks. Dolfman's (1974) findings suggested some degree of confusion with allied health education in that more than 100 individual job classifications were found, each with its own perspective of what its responsibilities entailed. Due to the absence of professional identity or status, such situations could result in lack of motivation and dissatisfaction. Dolfman suggested researching the need for allied health workers to indicate flexibility in performing a variety of roles. An Alabama study (1976) attempted to determine whether one individual might be trained to perform duties usually performed by several specific workers in the allied health area. A Multiple-Competency Clinical Technician Program was developed to train one person in the entry-level functions of a medical assistant, a medical laboratory assistant, and a nursing assistant. The program has been successful thus far, as measured by the response of graduates and their employability.

Pellegrino (1977), in discussing the problem of fragmentation and specialization, suggested that the trend toward unguided proliferation of allied health workers is socially untenable and fiscally unsupportable. In order to bring about some convergence in functions as well as number of workers, Pellegrino suggested use of task analysis to reduce functions to basic commonalities. These tasks might be reduced to as few categories as possible according to basic professional functional groupings. This approach could result in clusters or core curricula.

Well-defined job functions tend to lead to higher levels of job satisfaction. Treece (1969), investigating vocational choice and satisfaction of licensed practical nurses, concluded that the greatest vocational problem was their ill-defined role. In

contrasting job satisfaction of licensed practical nurses who remained in the field and those who left, the major difference reportedly was dissatisfaction with opportunities for career advancement.

Porter et al. (1973) investigated job satisfaction and organizational commitment as two predictors of job turnover for psychiatric technicians. Job satisfaction measures were initially better able to differentiate future "stayers" from "leavers."

Quality of care administered by workers appears to be related to their perceptions of job satisfaction. Rayner (1977) identified two factors which seemed to lead to more participation by direct care givers in the decision-making process, namely, the frequency they were involved in shared communications and the amount of rules regulating staff behavior. It was reported that it was important to keep the latter to the necessary minimum.

Mangelsdorff (1976) attempted to determine the effects of providing feedback on job satisfaction of Dental Therapy Assistants (DTAs) during several weeks of training. The longer training periods related to higher levels of satisfaction with supervisors, suggesting effectiveness of praise-reinforcement from dentists working with DTAs. Short-term training seemed to result in DTAs unable to evaluate their performance. Therefore, the absence of feedback might well cause a lack of self-confidence resulting in poor job performance and lowered job satisfaction.

In a conference sponsored by the Health Resources Administration (1975) on women in health care, it was reported that 75 percent of the health resources were females who received lower pay than their male counterparts and who had little authority or control within the system. Navarro (1975), reporting on the role of women in the health care system, concluded that the situation was not a "women's problem" but that it existed as a result of factors influencing the system. Those factors generally indicated that men controlled the system and that women were affected by male domination. Navarro recommended further research to analyze the entire socioeconomic and political system that appears to perpetuate this situation. It was suggested that equal representation on boards of health agencies should be enforced.

EXTERNAL FACTORS WHICH AFFECT THE PROBLEM

Schiavone (1969), reporting the results of a a study on inactive health workers suggested the following goals: increase the

supply of health workers by locating health personnel and promoting their active employment; assist in the return to active employment of as many health workers as possible; and develop the details of health personnel needs by category and geographic area. Nursing appeared to have the greatest need and was selected to serve as the project's focus area. Data from questionnaires completed by a portion of the licensed, inactive professional nurses in New Jersey identified the following employment barriers: low salaries, lack of part-time opportunities, need for refresher courses, and lack of child care. The Missouri State Division of Health (1968), in a similar study of inactive registered nurses, found that most of its sample had been inactive less than eight years. Respondents usually listed family responsibility as their reason for the inactive status, and listed convenient hours as the primary factor influencing their return to nursing.

Young (1969), assessing former servicemen in the Army Medical Department, attempted to determine their utilization in the civilian health field. Data revealed the number of such individuals to be significant; a substantial portion indicated they were amenable to employment within civilian health careers. Employment barriers included inadequate pay and fringe benefits, failure to recognize military training, and limited advancement opportunities. The study identified a need for evaluation and recognition of military training and experience by potential employers.

Nathan (1970) conducted a similar study to determine how to increase the utilization of military trained medical personnel by civilian health care systems. The findings disclosed that military men were influenced in their decisions by the military branch served, the length of service, military status, knowledge of the labor market, and type of military work experience. Policies and recommendations to facilitate the transfer also were presented. The study identified two major barriers to civilian employment, namely, formal requirements of education and the levels of pay for training.

Awareness of the course work required in military training could help in transferring medical personnel from military to civilian work settings. The American Hospital Association (1971) published such information on military paramedical training of health care personnel.

The American Hospital Association (1973) also published an annotated bibliography on aspects of human resources, with a special section on minority group employment which included references dealing with policies, education, recruitment, employment, retraining, and upgrading. Adams and Grant (1974) observed that black students received little help in

career choice, particularly as it related to their community's needs. The authors suggested the need to examine barriers in their entering health occupations education programs, such as grade-point averages or aptitude test results.

Evans (1973) explored the adequacy of black health workers as well as the availability and accessibility of both emergency and routine health care facilities for the black population. Apparently maldistribution and underutilization of existing personnel could be approached by more intensive efforts toward programs aimed specifically at this target group. Similarly, Cresap et al. (1972) studied factors contributing to the shortage of health professionals of Native Americans. An effort was made to determine the extent to which selected training programs had assisted them in reaching their highest potential as health care workers.

While there is a need to involve more minority groups in the health fields, there has been limited evidence of success. Franke and Sobel (1968) attempted to determine the influence of selected barriers upon entry to and employment in six occupations including licensed practical nurses and medical technologists. One of the findings was that health occupations utilized more persons from minority groups than did other occupations. A note of caution suggested that both of these health occupations were limited in providing opportunities for advancement, which is another severe problem among minority groups.

In the late 1960s and 1970s, several studies (Columbia University, 1969; Comprehensive Health Planning, Inc., 1973; Office of Economic Opportunity, 1969; Rubinson and Allegrante, 1977) dealt with the effective use of community residents and non-professionals. The studies stressed the need for more effective use of indigenous personnel through upgrading and training, the need to know the consequences of using such personnel, and ways in which they could help other team members understand the local communities.

Greater use of handicapped personnel in the health fields has been slow in developing. This is attributable to such factors as lack of appropriate attitudes of other health care workers, limited supportive services, lack of proper architectural design, and inaccessibility of transportation. Undoubtedly, Public Law 94-142 should assist in overcoming such factors and should encourage more handicapped individuals to enter the health field.

Rast (1968) studied the feasibility of training mentally retarded individuals to function in hospital settings. The project provided an organized and formal course of training to help students reach their objectives. In addition, it also attempted

to determine factors that would lead to successful employment by mentally retarded individuals. Of the fifty-one students in the program, seventeen were employed as nursing aides and eight in civil service jobs. Students with reasonable degrees of control over their own behavior - and were capable of reading at the fourth grade level - were shown to have promise of success as nursing aides.

The Skills Conversion Project of the National Society of Professional Engineers (1972) studied the transition mechanism required to move engineers from aerospace and defense industries to private and public industries, including the health field. The study reported on some of the tasks which engineers might perform in this field. Engineers could apply modern techniques for managing large-scale systems and, thus, free some of the physicians. In addition, by improving communication and recordkeeping, the overall cost of health care could be reduced. In short, engineers could assist in the research, application, and services of new methods and devices.

Larkin (1973) conducted a project which encouraged police and fire fighters to prepare for careers as nurses upon their retirement. Since most of these personnel were retired at a relatively young age, they could help meet the shortage of health care personnel. Lastly, Horrman (1973) discussed a course which prepared the business education students for the duties of medical secretaries. The course involved intensive practice with a high degree of speed and accuracy in taking dictation and transcribing materials related to the medical profession.

PROGRAM PLANNING AND ADMINISTRATION

INTRODUCTION

Meaningful decisions on the planning and administration of health education programs will occur only when adequate data exists relevant to the present status and projected future of the health care system in America. It is essential that specific knowledge of the system be understood in order to provide effective delivery of programs. These components include: determining the need for programs; utilizing advisory committees in planning and implementation; recognizing requirements for accreditation, licensure, and certification; projecting budgetary requirements; determining facilities and equipment; establishing and maintaining cooperative coordination between educational programs and health agencies providing clinical experiences; and selecting effective personnel for administration and faculty positions in the proposed programs.

At the risk of understatement, constraints exist to affect health care program design, implementation, and evaluation. While these constraints vary, it is generally recognized that the competition for federally allocated funds emerges as one of the most significant constraints. In many instances, competition for available monies precludes systematic needs identification. This is a direct result of inadequate time for planning. Hence, in lieu of substantiated data to justify program implementation, "felt needs" become the frequent basis for initiating programs aimed at producing additional workers for the health system.

A major problem facing those in health program planning is having the time to obtain pertinent data relevant to the necessary components and, at the same time, remain in a competitive position in order to receive federal funds.

Apart from justifying programs on the basis of "felt need," another important issue stems from the constraints of time in selecting and using advisory committees. Effective program planning should include the use of such committees, as well as other aspects of community involvement. However, these steps often are overlooked because of the difficulties encountered and time required for involving others during the actual planning phases.

A third significant issue is accreditation. In most instances, graduates of health care programs who wish to practice must complete an accredited program. The literature is replete with discussions of the advantages and disadvantages of the current accreditation process. The establishment of standards is an

issue requiring analysis in attempting to meet the overall goal of improving the health care system. Accreditation may well be the single most crucial issue affecting personnel development and supply.

Lastly, a fourth issue is that of coordination between health occupations education institutions and health provision agencies. Articulation is crucial both for students and career mobility for health personnel. Effective linkages are essential with regard to clinical training sites for students and designing such training to meet the needs of the institution providing the clinical rotation.

Prior to establishing a health occupations educational program, there are several points to bear in mind. Frequently, data gathered from regional, state, or local surveys are used as the basis for establishing programs. It would appear that another viable resource is the local plan for health care services which identifies those service areas not currently provided within a locality and which clarifies the specific competencies needed to respond to the locality's problems in health care delivery services. The identification of such competencies at the local level might suggest establishing new job descriptions for health care workers. In general, the absence of such information can be attributed to the cost involved and time required. In a manner similar to the constraints placed on obtaining requisite information for competition for federal dollars, constraints imposed by time and money affect those programs unrelated to federal funding. Beyond this, even if the need for a program should be established, the issue exists of identifying an educational facility whose purposes are congruent with the establishment of the program.

USING SURVEYS TO OBTAIN DATA

The use of surveys to obtain data to determine needs for health education programs is extensive. They generally fall into one of two categories: institution or agency conducted. Publicly-supported institutions of higher education appear to rely on data collected from surveys conducted by the institution (University of California at Los Angeles, 1977; Jense, 1971; Maney and Boyd, 1974; McKay and Lucas, 1977; St. Louis Junior College, 1968; Willett, 1972; University of Wisconsin, 1972; and Zimmerman and Cernic, 1968). Other institutions used data collected by state agencies (Callan, 1972; Colorado State Board for Community Colleges and Occupational Education, 1972; Michigan State Department of Education, 1970, Montana Commission on Postsecondary Education, 1974; and Texas State Office of Comprehensive Health Planning, 1970).

PERFORMANCE OF COMPETENCIES

Light (1970) suggested using job analyses for entire specialties or total functional areas to determine competencies which either are omitted or are not attempted by more than one type of health care worker. Joiner and Blayney (1974) suggested that one should match the capabilities of trained health care workers with identified tasks to be performed on the job. The latter approach was suggested as leading to more general, but fewer job categories, within the health field.

Another approach for providing all competencies or tasks requisite to health care delivery is the creation of new and highly specialized jobs. One of the most discussed expanded roles has been that of the physician's assistant (Collins and Bonnyman 1971, Lambertsen 1972). Data indicate reasonable acceptance of this approach by the public and an increase in productivity within health care system.

New educational programs for mid-level mental health workers described by Baker and McPheeters (1975) and Euster (1971) have allowed the health care system to increase its social and emotional supportive services. An education paraprofessional, the child health care worker, provides similar supportive services to a selected portion of the public (Felton & Hall, 1976). The clinical health educator described by Ziering and McTerman (1975) and the community health educator described by Stone (1972) have been established to provide personnel to assist the consumer in accepting more resporsibility for his or her individual health.

COMPATIBILITY WITH SCHOOLS' GOALS AND PROFESSIONAL ORGANIZATIONS' POLICIES

The philosophy and the purposes of an institution rank high among the criteria for determining the placement of a health education program within that institution. Moore (1974) discussed the extent to which technical level health occupations education programs assisted a private college to achieve the goal of admitting students who previously might have been classed as unsuccessful. Hogness (1976), in discussing the general purposes of the health science schools, suggested the need for more coordination within the various schools of a university. Pyne (1975) discussed the administrative placement of the health related programs and under which specific administrative level such programs should fall. Elder and Blayney (1973) described a method for determining the objectives for an entire school of allied health programs and a method for participation by the various program directors. These studies indicated that success

is maximized when the objectives of each health occupations education program fit within the overall philosophy of the school housing them.

It is reasonable to assume that professional health organizations are likely to support policies which influence the respective educational programs within a particular health area. For example, the American Nurses Association published a position paper in the mid 1950s which urged the extinction of hospital-based schools of nursing and their replacement by programs in colleges and universities (Hunt, 1974). Subsequently, this position has been accepted by various state associations (such as the New York State Nursing Association which has greatly influenced the demand for various levels of nursing programs in that state). A shift such as the one encouraged by the policy of the New York State Association could result in an unanticipated effect on the quality of the future supply of nurses (Altman, 1971). Bayer (1973) indicated that such policies might not be best for the health care delivery system as a whole and suggested the need for empirical research on which to base such decisions.

INVOLVING COMMUNITIES THROUGH ADVISORY COMMITTEES

When carefully selected advisory committees actively participate in program development, the benefits are numerous. However, often committees exist in name only and are not encouraged to be an active component. As illustrated by the National Advisory Committee for the Allied Health Professional Projects at UCLA (1968), such committees should provide guidance during all phases of a program and especially during the initial planning and development stages.

Kassel (1971) reported a model and guidelines for organizing a working coalition of concerned community groups in resource planning and implementation. For example, committees could be divided into various task forces covering broad areas of expertise. A technical assistance task force could evaluate the proposed design for the health worker training program. A "human resources priorities" task force could develop processes whereby needs could be identified. A "barrier removal" task force could assist in identifying and eliminating restrictive legal, educational, and administrative barriers, and so on.

Nerden (1977) described the advisory committee as a powerful incentive to program improvement. Their contributions could include stimulating community participation, resulting in better understanding of the value of such programs.

The American Association of Junior Colleges (1970) reported a conference on biomedical technology programs in which the role of industry was identified as helping determine curriculum content and making expensive equipment available. Studies by Lipscomb and Wallace (1968) and Henrich (1969) suggested similar tasks for committees.

ACCREDITATION AND LICENSURE

Accreditation standards can serve as a guide in planning for various health occupations education programs. Since most programs must be accredited in order for graduates to be eligible to take state or national certification examinations, the implementation of such standards is essential. Roemer (1974) defined accreditation as the voluntary mechanism by which an agency or organization recognizes a program or an institution as meeting certain predetermined standards. Licensure was defined as a legal mechanism by which a governmental agency authorizes persons who have met specified minimal competency standards to engage in a given profession or occupation. Both processes exist to protect the public in that they assure that health workers are qualified to perform specific services for consumers. Roemer also identified important needs, the need to research decisions made relative to accreditation and the need to consider the concept of institutional licensure rather than the licensure of individuals. The latter would permit flexible use of personnel within the institutional settings.

Two publications of the American Medical Association (Part 1, 1971; and Part 2, 1972) contained working papers on accreditation. The peer review concept of accreditation was questioned, since such processes might be more concerned with professional rather than public interest. Questions were asked regarding the organizational structure of accreditation, namely, the potential of a profession exercising controls over related professions and technologies. A prime example of this is the on-going dispute between medical technologists and pathologists. The papers also discussed increased costs to the institution which are incurred as a result of accreditation. Possible solutions to this problem included using more clerical staff to prepare self-study documents and sending volunteer inspectors instead of professional staff to visit sites. A third plan which holds promise, and some degree of popularity particularly in larger schools hosting several accreditation visits, would be joint visits with the intent of accrediting several programs simultaneously.

Zimmerman (1974) discussed the importance of the self-study component of accreditation. Some important issues in this component include having the primary focus on learning and

teaching; assuring relevant curriculum; establishing an effective system of student evaluation; assessing the reliability and validity of admission criteria and procedures; and investigating the productivity of graduates. Zimmerman stressed self-study as being not a time-consuming activity aimed at filling out forms but rather an internal evaluation process aimed at providing relevant data for making formative decisions for improvement.

Hume and Seibert (1977) described one college's favorable experience with a joint site evaluation involving four allied health programs. Advantages in using the joint approach included its being less time consuming and less repetitive, interfering less with educational and administrative processes, supporting development of interdisciplinary cooperation, and allowing for evaluation of broad institutional concerns.

The licensure process has been considered in several of the health areas. White (1978) suggested that the occupational licensure of clinical laboratory personnel has imposed constraints on entry into licensed occupations and has led to a division of labor between occupations. White cited an earlier study which showed no differences in accuracy between laboratories in New York, where there was no licensure requirement and those in California, which has a stringent licensure law. The study recommended the need for research about other methods of regulation, including proficiency tests, to assess the quality of output. The study cautioned that in introducing new licensure laws, or in strengthening old ones, such actions might sharply increase costs and leave quality unchanged.

Another question relevant to licensure occurs in the nursing services area. Although the same state board examinations are offered to all graduates of the three types of programs for registered nurses, the professional organization suggested that employers should have different role expectations for each type. In fact, the professional organization has recommended that the diploma type program be discontinued (Coggenshall et al., 1969). Tibbits (1968) reviewed research studies related to health occupations education in which one study (by Moore) attempted to identify differences in the three types of programs for registered nurses. It reported that although most of those surveyed felt there was a difference in the three types of programs, the differences cited were in the broad areas of skill level, depth of preparation, and ability to assume leadership roles. These were cited rather than differences of the three types of program objectives. If such differences are valid, the issue arises as to whether there should be different state boards required of the graduates of each type nursing program. Trends in both the accreditation and licensure processes of nursing

programs have caused dissention rather than unity within the profession. Kuramote (1978) recommended several points in attempting to arrive at a unified position. They were - that the accreditation teams have representatives from each of the three levels of nursing; that criteria be revised to address specific procedures for mobility; and that the three councils of nursing education be merged into one.

The National Commission on Accrediting (1972) published a report concerned with the accreditation of fifteen selected health occupations education programs. The report presented a summation of the basic issues and problems considered by the commission.

The American Medical Association (1969) published a document which presented guidelines for accredited programs for medical assistants, nuclear medical technologists, orthopedic assistants, radiation therapy technologist, and radiologic technologists. The essentials of administration, organization, faculty, facilities, admission, health curriculum ethics, and admissions were outlined.

Often the professional association for a specific health area will publish the essential requirements for accreditation of that specific program. The American Dental Association (1971) published such criteria for the programs concerned with dental hygiene education. The American Association for Respiratory Therapy (1968), the National Association for Practical Nurse Education (1973), the American Optometric Association (1968), and the American Society of Radiographic Technologists (1966) each identified the specific criteria for accreditation.

Another method exists in the attempt to protect the public in this area; namely, the certification process. Roemer (1974) defined the process as a voluntary means by which a nongovernmental agency or association grants recognition to an individual who has met certain predetermined specified qualifications. Sweezy et al. (1974) conducted a study to determine the feasibility of implementing a national voluntary system of certification of allied health personnel. A major conclusion was that such a system was feasible.

General guidelines often are published to assist administrators in meeting accreditation standards for one or more programs. A handbook published by Gregg/McGraw Hill (1972) and a booklet by the Public Health Service (1968) give information on how to design health occupations training programs by considering content, length of training, costs, types of facilities, and staff required.

Killen and Shechtman (1969) identified several factors for consideration in determining needs for health occupations programs. These included difficulty of recruitment, limitation of facilities and/or faculty, time required for training, costs of training, constraints of licensure, and turnover rates among employed program graduates.

Several guidelines for specific health areas have been published to assist administrative and instructional personnel. The Michigan League for Nursing (1968) and McClelland and Dunkleman (1979) developed guides for beginning a nurse aide/assistant program. Schmidt (1966) attempted to discover factors promoting or inhibiting establishment of associate degree nursing programs. Such factors included costs of programs, adequate physical facilities, clinical facilities, and the availability of qualified program directors and faculty.

The American Association of Junior Colleges (1966) developed guidelines for a one-year plus one summer session program and a two-year associate degree program for medical record technicians. The guidelines included program organization and planning.

Chicago Area Allied Health Manpower (1971) published guidelines for use in developing programs for physicians' assistants. Suggestions were made for determining roles in relation to other health personnel, defining types and roles, recruiting and training, determining career pathways, and determining issues of licensure and/or certification. Gladhart and Crespo (1977) described the establishment of a physicians' assistant program at Wichita State University. The report included the program's funding, essentials for accreditation, legislation, curriculum, student information, graduate information, and program evaluation. The Southern Regional Education Board (1976) developed a guidebook for developing associate degree mental health/human services programs for use by program directors, college officials, faculty, advisory committees, and agency field instructors. Cowley (1976) presented insights into the anxieties and barriers faced when designing a new type of health education program.

PROJECTING PROGRAM COSTS

Chase (1970) explored cost analysis in allied health education programs. Seven schools of allied health conducted self-analyses. However, the results were disappointing due to the time limitations and the lack of resources. It was found that the total expenditures for allied health programs at an academic institution depended on two factors: the expenditures

for particular curricula and the combination of curricula at that institution. The report also discussed the value of knowing the total cost for a program in preparing budgets, raising funds, and increasing efficiency.

Tworek (1977) provided an example of how unit cost analysis might be used in planning programs. A brief overview of the systems approach to the decision-making process presented some of the more important components such as effectiveness, efficiency, cost-effectiveness, and a definitive description of unit cost analysis.

FACILITIES AND EQUIPMENT

Surveys to determine available facilities for health occupations education programs have been conducted at the national, state, and local levels. The National Center for Health Statistics (1970) provided statistics on health resources and inpatient health facilities for evaluating, planning, and administering health occupations programs. The American Hospital Association (1970) determined the extent to which hospitals were working with local junior colleges in providing hospital clinical settings for the education and training of students in health service education programs. The Albany (New York) Regional Medical Program (1970) reported available educational facilities for training health care personnel. Bruce (1973) surveyed medical and allied health libraries in North Dakota and defined the goals for the learning resources and health science library.

MacConnell et al. (1969) developed a guide for planning facilities for specific health care areas such as medical assistants, medical secretaries, dental hygienists, dental assistants, dental laboratory technicians, and radiology technicians. Each guideline suggested the following to help in planning: Space and facilities should be planned to accommodate changes in the program. The program should meet the needs of a variety of groups within the community. Space and facilities can be extended through the use of community resources. Safe and healthful housing must be provided for all students. Space and facilities must be considered within the context of the total educational program of the institution and community.

Rosenbrier (1975) described a one-year pilot career program for biomedical equipment technicians especially designed for handicapped students. The study showed that when architectural barriers were removed, education and career fulfillment became possible. The study stressed the need for each program to

meet Occupational Safety and Health Administration standards. Lastly, the National Academy of Sciences (1970) published a report which presented medical requirements for ambulance design and emergency care equipment.

ADMINISTRATIVE AND LEADERSHIP SKILLS

It is obvious that a distinction is sometimes made between administration and leadership. Higley and Noall (1972) suggested that whereas administration should be concerned with routine day-to-day technical decisions, leadership connoted critical decision making. They indicated that leadership involved three specific areas: defining the mission of an organization, institutionalizing a value system, and defending institutional integrity.

Hayes (1976) listed the following fundamentals for effective leadership: establishing the goals of the organization, designing a system to achieve the goals, selecting staff with abilities to operate the system, providing incentives and motivations to maintain and improve staff morale, and establishing an on-going assessment of the client-product needs.

Black and Taziri (1971) suggested that leadership combines knowledge with skills in human relations and that this might be a serious problem for many health workers trained in disciplines requiring high degrees of inflexibility. Cooper (1971), noting that leadership involves mobilizing people into action, listed several qualities used in working with others; for example, respecting the dignity of patients; not imposing one's will on others; creating climates for groups to work together; having one's own ideas but recognizing that others have ideas equally as good or better; encouraging expression of new ideas and innovative approaches; granting others the right to fail with the recognition that one can learn from failure; and being creative and minimally aggressive.

Flitter (1971) described the need for nursing leadership, particularly in the community. The recommendations related to improving quality patient care and cooperating with professional organizations. Morgan (1971) identified as an issue for research the question of selecting potentially effective leadership. The report also suggested that the present selection process, using grade point averages and selected test results, is inadequate. It suggested that a master research plan be developed through which those concerned with health resource identification could predict three groups of workers: those satisfied as practitioners, those who emerge as teachers or administrators, and those who drop out of the nursing field entirely.

COOPERATION AND COORDINATION

Davis and Larson (1976) reported on the state plans for Minnesota which stressed the development of a coordination process for allied health education programs. Goldenberg (1974) described the coordination of nine Kansas City area hospitals which sponsored one nurse aide program at the vocational technical school. Cooperation allowed for exchanging teachers in the staff development departments. Hood and Thompson (1976) designed a blueprint for health career education and training in the District of Columbia schools. The blueprint reported a strategy for implementing a comprehensive, multi-focal health careers program, including a mechanism for interagency communications at all levels. The report also established a framework for identifying individual black, minority, and disadvantaged youth early in their secondary school education in order to assist them in exploring health-related careers.

CURRICULUM DEVELOPMENT

INTRODUCTION

Curriculum development in vocational education historically has been affected by such forces as occupational role expectations; legislation and educational governance; economic, political, and social concerns; and technological, social, and value changes. In health occupations education, a change in either the social systems of education or health care delivery affects curriculum development. The research reported below primarily reflects curriculum development which has been influenced by legislation, changes in role expectations, and technological change.

Curriculum development issues in the area arise within the context of health care delivery and the teaching-learning process. Some of these key issues relate to health care for target groups, expanded role expectations of practitioners, task-oriented job expectations, quality assurance, and occupational safety and health compliance. These factors impinge on the teaching-learning process. Thus, career mobility, competency based vocational education, and articulation were the contexts within which the following major issues were identified:

1. Developing competencies, conditions, and standards, and measuring learning through criterion-referenced measures for varying levels of practitioners

2. Recording competencies of program completers when accreditation/credentialing standards have different requirements

3. Developing objectives for clinical/practicum experiences based on task-oriented job expectations rather than a time framework

4. Identifying entry level employability skills and providing open entry/exit in the curriculum under the conditions and standards stated in the objectives

5. Recognizing various roles of the teacher including being a member of a health care specialty.

The utilization of agencies in health care delivery by multiple educational programs has mandated that curriculum developers determine objectives, placement, and relevance of selected clinical experiences/practicums; seek participation of learners in the development of objectives for clinical experiences; develop contractual agreements which define expectations related to the teaching-learning process in clinical agencies; review

accreditation and credentialing standards for clinical objectives in program development; and utilize alternative approaches to clinical experiences such as patient/clinical simulation, patient management problem simulation, and computer assisted simulation.

TASK ANALYSIS

Developers of vocational education curriculum have used task/job analysis as their foundation. This development has centered primarily on the inanimate job itself. However, the other modes of occupational expectations (e.g., relationship of the workers to others on the job, to themselves, and to others outside of the job) have also received attention. These four modes of occupational expectations have been described by Rofstrand (1975).

The task analysis process was described by Byers et al. (1972) in developing training programs in the following nine allied health areas: nursing, inhalation (respiratory) therapy, radiology, clinical laboratories, medical records, food services, hospital business office, ward management, and emergency medicine at the technical level. Following this, Byers et al. (1973) described the process of developing task-related curricula which included several steps: completion of a pre-task analysis to develop a brief description of the job, completion and analysis of the task description, and determination of curriculum and instructional units. The definition of tasks should make provisions for listing equipment, materials, and tools as well as the external conditions affecting performance of the entire task. It also should list the stages of the performance and the various elements within each stage. The description then should be analyzed for the requisite skills, knowledge, and attitudes and the methods for presenting it to students. Similar tasks should be grouped to avoid repetition; the elements (basic skill level above that of fine motor skills) should be categorized according to their stages to determine similarities across tasks. Two comprehensive projects utilizing task analysis were the Health Services Mobility Study of California at Los Angeles Allied Health Professions Project. These are described below.

Health Services Mobility Study (HSMS)

The project, reported by Gullion and Gilpatrick (1973), developed a method of analyzing health occupations at the professional, technical, and aide levels. It attempted to provide a data base for designing job ladders, curriculum guidelines, and performance evaluation instruments. Three additional volumes of the study described application of the task method to specific areas.

Gilpatrick (1977a) described the components of the method of task analysis, job ladder design, and presented a manual for using HSMS computer-based statistical procedures to design job structures and ladders. The manual, among other things, included coding and preparing HSMS task data for computer-based analysis.

Gilpatrick (1977c) described the application of the HSMS task analysis method in diagnostic radiology including several career ladders starting from the aide, to the technician and radiologic technologist, with options to continue to supervision or to radiation physicist levels. The report identified a new job-quality assurance technician, included a mini-manual for performance evaluation using HSMS task data, described components of a safe practice and quality assurance program, and included a checklist for the consumer.

Lastly, Gilpatrick (1977b) described the application of the HSMS task analysis method to the tasks in radiation therapy and diagnostic ultra sound. Eighty-six new task descriptions at the aide, technician, and technologist levels were arranged by functions. The interrelationships of the tasks in diagnostic radiology, ultra sound, and radiation therapy were shown. The skill and knowledge overlap across specialties also was described.

University of California at Los Angeles (UCLA)
Allied Health Professions Project

Described by University of California at Los Angeles (1970), these projects attempted to create curriculum and instructional materials for those allied health functions that could he taught in programs through the associate degree level and to develop inservice and preservice programs for health-related occupations in which on-the-job training plays a primary role. The staff examined, for each occupation, identification of all possible tasks; verification of tasks; the processes involved in performance, and the knowledge and skills required; performance objectives; development of curriculum, including the career ladder concept, continuing education, attainment of degree objectives, and transferability of credits earned; development of innovative instructional materials; identification of teacher education; evaluation of student performance; production of instructional materials; and distribution of materials. In describing the project, Anderson (1974) indicated that articulation and career mobility could best be achieved through a particular type of task oriented curriculum.

The development of curriculum based on task analysis was described in a number of studies, as noted below.

1. Dental Auxiliary Occupations. Kingston and Freeland (1971) summarized the UCLA project activities related to the dental auxiliaries and analyzed interrelationships existing among the three auxiliary occupations of dental assisting, dental hygiene, and dental laboratory technology. In addition, they proposed suggestions for the preparation of instructional materials for dental auxiliaries based on task analysis and presented survey data on dental assisting, dental hygiene, and dental laboratory technicians.

2. Occupations in Electroencephalographic (EEG) Technology. Freeland (1972), in reporting on the task analysis for the occupational area of electroencephalography (EEG), attempted to validate the task list for the EEG technician and to aid in the development of a quality training program for such technicians.

3. Engineering Maintenance Occupations. Cullen et al. (1971) described the task analysis procedure used for the occupational areas of hospital engineering and maintenance, and the implications for curriculum development in personnel training. A questionnaire consisting of a task list of 386 possible tasks was developed and tested among maintenance department personnel in hospitals in the Los Angeles area. The findings were based on data from a national sample of respondents in forty-eight health care facilities in six cities. The following points were noted: differentiations of tasks performed by maintenance personnel could be made among occupational titles and categories; a clear division of labor existed between maintenance superintendents and maintenance workers; curricula for superintendents needed to be management related and to include knowledge and skills necessary for task supervision; and all maintenance workers needed training in a common core of tasks with additional training to qualify in one of the three maintenance categories.

4. Hospital Food Services Department Occupations. The objectives of this part of the project, described by Gosman and Krishnamurty (1971) were intended to compile a comprehensive inventory of tasks which made up the food service functions in health facilities, to analyze which of the tasks were currently being performed by various levels of personnel working in the food service department, to determine curricula components to satisfy the training needs required by various levels of personnel, and to ascertain a pattern for upward mobility in the development of a curriculum. Data revealed that there was considerable overlapping of tasks by various occupational levels. Designation of tasks by an expert panel to a specific category of worker was frequently found to be at variance with actual practice. Many tasks were rated higher in difficulty by the

panel than by personnel performing the task, and no discernible relationship was revealed between difficulty and technical knowledge.

5. Medical Office Assistant Occupations. DiCicco (1971) summarized a functional analysis of occupational groups employed by physicians in providing out-of-hospital services to patients. A task inventory was developed to determine which categories of workers assisted pbysicians and which tasks were delegated to them. The inventory included tasks in two broad categories: 124 tasks related to administrative functions, and 108 classifieu as clinical and technical activities. Analysis of responses from 292 registered and licensed nurses, medical office assistants, and administrative and clerical personnel revealed that physicians' employees were utilized in numerous capacities regardless of background, training, or job titles; although employees performed both administrative and clinical or technical functions, the frequencies of certain tasks differed depending on job title. Consequently curricula for training physicians' employees should be designed in the form of modules according to function.

6. Medical Laboratory Occupations. The University of California at Los Angeles (1971) reported on a study designed to determine the percent of medical laboratory workers who performed a comprehensive list of tasks and procedures; evaluate this performance in terms of certification and specialty areas; and recommend curricula for medical laboratory personnel. The data indicated that routine tasks included equipment maintenance, specimen processing, and the use of laboratory equipment; tasks in the four clinical areas of urinalysis, hematology, microbiology, and biochemistry could serve as a basic curriculum for beginning students; some difficult training procedures should be delayed until the appropriate educational background is developed; and a yearly curriculum review was necessary to insure continued relevance to educational needs. Utilizing these results from the task analysis, Taub (1972) also reported a curriculum outline based on different levels of laboratory tasks according to the knowledge and skills required to perform them. Designed to enhance career mobility, the model of individualized instruction consisted of entry level general laboratory skills and knowledge and basic skills in the sections on the clinical laboratory. The modules (self-contained instructional segments) included performance objectives, skill lessons, materials and equipment required, step-by-step illustrated procedures, and performance checklists.

7. Medical Record Occupations. A survey of forty-eight hospitals and extended care facilities was conducted by Gosman et al. (1970) in an attempt to analyze those tasks which were

performed by personnel in the medical record department and to determine the components of a medical record curriculum. The survey indicated that there was no discernible relationship between seriousness, difficulty, and technical knowledge as rated by the National Technical Advisory Committee; members of the committee rated most tasks higher in difficulty than the personnel performing the tasks; and 25 percent of the respondents had no previous training before employment in the medical record department. The major implication for curriculum development was that it would be possible to provide vertical and lateral mobility for personnel in the medical record department by grouping tasks into educational categories and developing a progression of skills and knowledge to meet performance levels.

8. Nursing Occupations. Goldsmith et al. (1970), reporting on this section of the project, attempted to determine nursing tasks and make committee recommendations for those tasks. A survey instrument of nursing tasks was developed, validated, and administered to 450 nursing personnel representing forty-eight hospitals and extended care facilities. An 88 percent response rate was reported, with these results: all categories of nursing personnel performed 60 percent of the tasks; the setting of the agency appeared to be a factor in the utilization of the lower skilled worker (nursing aide) in more critical nursing tasks; routine safety and comfort measures - as well as nutrition and elimination tasks - were performed more frequently by nursing aides and licensed vocational/practical nurses, implying that the basic instructional unit should be concentrated in these areas; and administrative tasks were done most frequently by registered nurses, suggesting that this content should be in the more advanced nursing education sequence.

Wood (1970) updated information on the nursing occupations portion of the UCLA project. A frequency rating for each one of 306 nursing tasks was used to place the tasks into three lists: those performed by all categories (nursing aides, licensed vocational/practical nurses, and registered nurses); by the registered nurses and licensed vocational/practical nurses only; and by the registered nurse only. The next step was to determine the scope and sequence of the units. Modules were developed for transferability from one occupational cluster to another.

9. Nursing Unit Administration Occupations. Gosman et al. (1971) reported an inventory of 109 tasks, grouped as either clerical or management functions and distributed to a panel of experts and 243 unit administrative personnel. Analysis of 189 responses (77 percent) indicated that the tasks clustered into two groups (clerical and managerial). The performance of tasks

by various occupational levels was at variance with practices recommended by the expert panel; the expert panel rated many tasks higher in difficulty than the personnel performing them.

10. Pharmacy (in Hospital) Occupations. Evaluations of existing pharmacy personnel programs were conducted to develop a pharmacist and pharmacy technician task list (Henrich and Goldsmith, 1970). The list was validated and included tasks performed by the pharmacist and pharmacy technician in dispensing, manufacturing, purchasing and storing, and administering pharmaceuticals. The following two recommendations were made: that the task list be used as a guide to break down each task into smaller units, and that the tasks be analyzed to determine whether they should be taught in a classroom or clinical situation. The study demonstrated the need for pharmacy technicians. Cullen and Henrich (1971), also reporting on this aspect of the project, attempted to determine procedures used in health care facility pharmacies for the performance of tasks previously selected for inclusion in a proposed curriculum for pharmacy tecbnicians. Questionnaires were distributed to a national sample of forty-eight health care facilities. Based on data from thirty-one chief pharmacists, the following conclusions were drawn: dispensing and purchasing were two subjects that should be given first priority in the development of the curriculum; bulk compounding, prepackaging, and sterile solution manufacturing may be assigned a lower order of priority; and training in the administration of pharmaceuticals did not appear to be necessary for pharmacy technicians. The researchers also concluded that the results of the survey could be used to supplement the task list previously developed as a basis for curriculum development for pharmacy technicians.

11. Purchasing Occupations in Health Care Facilities. Medical facility purchasing is a field for which there is little historical background. Henrich et al. (1970) conducted a study to determine curriculum content. A survey of 131 individuals in twenty-nine institutions was conducted to obtain data on the frequency, supervision, and difficulty of performance in 208 task elements. Questionnaires concerning general purchasing practices also were sent to the administrators. Among the key findings and recommendations were the following points: some kind of central purchasing facility was found in most hospitals; both centralized and decentralized purchasing commonly existed at the same institution; purchasing functions generally were performed with little or no supervision and did not involve high levels of difficulty; nearly every purchasing function was performed at some time by persons other than purchasing agents; since diversity of policies and procedures existed, flexible curricula should be constructed; and instructional units should be designed to combine tasks related to a common function.

12. Hospital Radiologic Technologist Occupations. Reeder et al. (1972), working with a team of radiology experts, developed a task inventory (including radiological, administrative, clerical, research, and administrative tasks) which was sent to 169 persons employed in the radiology departments of thirty health care facilities. Data from 117 responses (69 percent) indicated that there appeared to be a significant differentiation between the various levels of radiologic personnel in terms of tasks performed and that there was little indication that a career ladder existed in the field of hospital radiology. Based on the analysis of survey data, the project staff rated the importance of each task in terms of inclusion in a curriculum for four levels of radiologic personnel: chief technologist, staff technologist, technical support, and non-technical support.

13. Respiratory Care/Inhalation Therapy Occupations. Task analysis data for this part of the project was reported by Freeland and Goldsmith (1971). Their major findings and conclusions were as follows: there was no quantitative difference between job title and the set of tasks an individual may perform; no evidence of a career ladder was observed within the occupational field; most of the daily activities of care centered on therapeutic tasks; a specialized set of tasks was composed for each group of employees identified in the survey; and curriculum development should be structured so that each higher level incorporates all preceding levels.

14. Social Service in Medical Facilities Occupations. Two reports were issued on this phase. The process of task analysis was described by Munoz and Goldsmith (1970). The National Technical Advisory Committee and a selected panel of social workers identified and rated tasks, skills, and knowledge in terms of cognitive level, human interaction, and job levels. Ways of delineating tasks for the entry-level and two-year college workers and definitions of the knowledge, skills, and attributes for performing those tasks were examined. The summary of the functional analysis of the activities for persons engaged in social service occupations in medical settings was reported by Ainsworth and Goldsmith (1971) who developed an inventory of 192 tasks related to intake, information, and referral; treatment; supportive services; and community and administrative services. The inventory was submitted to a representative sample of hospitals in six regions. Data from 148 persons employed in social services departments indicated that the community services function was performed least by the social service workers and that many more similarities than differences were discovered among aides, social work assistants, and social workers with masters degrees in both task performance and frequency of task performance. These researchers recommended that aides be given training to help

them perform the higher order treatment functions they were already required to perform and that persons with masters degrees in social work should receive intensive training in supervision of personnel management, performance evaluation, and task delegation.

In addition to these major studies, one researcher reported projects having to do with areas of common concern to all health occupations education. These studies will be discussed below.

Task Analysis for Science Concepts

The Coordinating Council for Health Science for San Diego and Imperial Counties in California (1970) sponsored a workshop for community college administrators and faculty (in anatomy, physiology, chemistry, physics, and microbiology) to develop science concepts for a core curriculum in the allied health field. Task analysis data was collected on the entry level tasks for medical, dental, and physical therapy assistants, radiologic technologists, inhalation (respiratory) therapists, and licensed vocational/practical and registered nurses. These data were used to develop proposed instructional units in anatomy and physiology, microbiology, physics and mathematics, and chemistry for each occupational area.

1. Dental auxiliary education. Two reports dealt with the utilization of task analysis for curriculum development in dental auxiliary education programs. Battelle Memorial Institute (n.d.a.) used a sample of dental departments in two hospitals, two public dental out-patient clinics, and several practicing dentists to identify the tasks performed by dental assistants and to evaluate the existing dental curriculum. Data indicated that many of the dental assistants learned their skills on-the-job and were used, in many instances, as receptionist, "care taker", errand girl, or personal secretary rather than in dental activities. To employers performance of laboratory procedures was not considered appropriate for the assistant; and employers rated eight assistant functions as to whether or not they should be taught in high school or on the job.

Terry (1973) attempted to develop a methodology of collecting data pertaining to dental tasks taught, and the responsibility levels to which they were taught, in preparatory curricula for dental assistants, hygienists, and laboratory technicians. The sample consisted of faculty and preceptor respondents from dental auxiliary programs in sixteen accredited institutions of higher education. A dental task inventory of 625 items was utilized; respondents were asked to identify the level of responsibility at which they taught the task and the cumulative time spent on each. Among the findings were the following points: faculty respondents had a high level of response stability but had

difficulty deciding whether or not they taught a task; the preceptors showed less response stability and knew whether or not they taught a task but were unsure at which level they taught the task; and no reliable responses were obtained to the question of time spent teaching each task.

2. Medical assisting. Keir et al. (1974) reported on an occupational analysis and job description for the occupation of medical assistant. The analysis contained 113 task statements which specified job duties (tools, equipment, materials, objects acted upon, performance knowledge, safety considerations/ hazards, decisions, cues, and errors) and learning skills (science, mathematics/number systems, and communications). The statements were grouped into five headings: (1) performing medical office management duties, (2) completing business office duties, (3) preparing and sterilizing instruments and supplies, (4) assisting with clinical procedures, and (5) performing basic laboratory procedures and diagnostic tests.

3. Medical secretary. Hope (1978) asked doctors in the Tampa Bay area to guide the revision of the medical secretary curriculum at Hillsborough Community College. The respondents reported that proficiency in the use of transcription equipment, rather than in shorthand, was needed.

4. Nursing skills. Several studies were reported on task analysis of nursing functions. The Pittsburg Board of Education (1967) concluded a project whose general objective was to conduct a job analysis for the surgical technician, practical nurse, and nurse aide programs. Check lists were designed to obtain the perceptions of registered nurses' supervisors on the importance of tasks and information from workers on the activity and frequency of performance. A behavior rating scale of technical skills and relevant attitudes of workers was utilized. Analysis of data indicated that, in most instances, the supervisors and the job holders agreed on which tasks were acceptable functions for the specified occupations and that paramedical education programs should be designed to fit tasks presently being performed. In a more detailed project, Kishkunas (1967) developed a model health occupations training program. Lists of tasks performed by nurse aides, practical nurses, and surgical technicians were developed through interviews with workers and job specialists; a study of hiring requirements, job descriptions, and daily activity charts; and observations by the staff. The lists were rated by 954 workers and supervisors in forty-three area health service institutions. Tasks reported as performed by no fewer than 50 percent of the workers were analyzed. From these analyses, sixty-one tasks common to the three occupations were used as the basis to develop the core curriculum.

Gilligan and Sherman (1974) studied licensed practical nurses (LPN), nurse aides (NA), and homemaker-home health care aides (H-HHA) in metropolitan Washington. Questionnaires were administered to 600 LPNs, NAs, and H-HHAs in thirty health facilities; respondents rated the frequency and importance of 346 tasks. The response rate was 492 (82 percent). A representative sample of employers also rated the tasks for each job title. The data indicated considerable task overlap between job titles and between patient care setting as well as much agreement between job titles concerning the frequency and importance of task performance. The data were used to develop an outline for an experienced-based core curriculum containing four modules of instruction organized for exit points for various job titles leading to the LPN level, as well as a model for community-wide involvement in aide education.

The task inventory approach to job analysis for nurses and related health care professionals was reported by Van Cleve (1975). Written as a guide for nursing supervisors and hospital administrators, the handbook defined job analysis, the qualitative aspects of job analysis, the basic structure of jobs, and users and uses of data; described the proper use of a job analysis including the definition and techniques used in job analysis; and described the task inventory method, analysis of task data, and inventory administration.

A comparison of task difficulty measures for nurses and medical service corps personnel was reported by McFarland (1974). A sample of 135 nurses and 133 medical service corps personnel completed difficulty ratings on tasks included in previously administered job inventories. The reliability of the ratings was analyzed; correlation between the two qroups of ratings was assessed. The findings reported that the correlation between the two groups was extremely high, suggesting that direct comparisons between difficulty of jobs performed by medical service corps personnel and nurses could be made without fear of bias as a function of raters.

5. Occupational therapy. The School of Allied Health Professions (1972) at The Ohio State University reported using Department of Labor's occupational analysis and job structuring procedures to develop job descriptions and curriculum for an occupational therapy program. With the assistance of the Ohio Bureau of Employment and members of the Occupational Analysis Division of the U.S. Department of Labor, teams consisting of a trained occupational analyst and an occupational therapist observed and recorded tasks performed by staff members of fifteen facilities selected in a national sample. The lists were assessed by sixty-three occupational therapy educators and practitioners to identify missing or delete irrelevant activities. During a job restructuring conference, the

tasks were divided into four job levels based on the educational and vocational level for training needs for each task; job descriptions were developed for each of the job levels of occupational therapy aide, occupational therapy technician, occupational therapist, and occupational consultant.

6. Physician's assistant. A report issued by Wake Forest University (1971) used functional job analysis to develop course outlines, training objectives, and goals for training physician's assistants. A systematic sampling of professional activities of small groups of pediatricians, family practitioners, surgeons, obstetricians, and internists was observed for four or five days. A medical student checked a prearranged activity sheet every thirty seconds in order to identify activities an assistant could be trained to perform and to determine the activities requiring the greatest percentage of the professional's time, both in the office and hospital. Data were tabulated and the percentage time distributions were completed. A committee for five specialty areas reviewed the results and agreed on those activities for which an assistant could be trained. It was reported that in all five specialties, the most time consuming activity was related to the gathering and organizing of data and information related to history taking and physical examination.

OBJECTIVES

Studies reported in this section pertain to objectives in the cognitive, affective, and psychomotor domains. A fourth domain, the perceptual domain, also has been identified. However, there appear to be no studies related to it. Several researchers reported studies which addressed the need to develop objectives to introduce students to the world of work, prepare them for employment, and take learning styles into account.

Barton (1974) has noted that the right of students to participate in planning their educational lives is central. In a course for the preparation of the nurse's assistant, the New York State Department of Education (1974) also noted that the paramount objective of instruction is graduate employability. Accordingly, their publication included modules on orientation to the world of work and occupational experience and job application. Alvir (1974) identified the following four problems in developing performance-based curricula: too much data, too little systematization, too little student participation, and too little time. Miller (1975), in pointing out that the current emphasis on patient adjustment to a health setting neglects the need for nurses to analyze the patient's basic patho-physiological problem, indicated that curriculum content and structure could be

identified on the basis of such analyses to determine the appropriate cognitive and technical skills and the correct actions to implement them. Schull (1972) discussed the combination of developing course guides designed to prepare students for employment and performance objectives.

Brekke and Gildseth (1974) sought to develop a core curriculum, career ladder, and challenge system. They also defined areas of basic commonality among various training programs. The intent of the curriculum was for the student to possess a foundation of knowledge and skills on which to build occupational mobility and permit upward academic pursuit. The curriculum included 785 measurable objectives.

McPheeters and King (1971) reported on a five-year project which used a developmental approach in preference to a job factoring approach. The intent of the program was to produce mental health generalists rather than specialists. Curriculum objectives included basic competencies such as the levels of proficiency for certain knowledges, skills, attitudes, and values.

Objectives in the Three Domains

The Southern Region Education Board (1976) examined specific curriculum objectives in terms of cognitive objectives; skill objectives, and values, attitudes, and self-awareness. The guidebook was extremely detailed and useful.

1. The affective domain. Morgan (1974) reported on ten papers which were presented at a conference in health-related education. The papers dealt with various aspects of cognitive and affective dimensions of student learning. They included such topics as a review of research on cognitive and affective dimensions of education for the health-related professions, the Canfield-Lafferty Learning Styles Inventory, personalization of instruction based upon cognitive style mapping, the Myers-Briggs type Indicator, and health occupations education.

The Oregon State Board of Education (1974) developed a taxonomy of health occupations education programs and course goals (K-12) and coded them for reference under health education program goals, career education program goals, and knowledge and process classifications. A concept/value code provided additional help in interdisciplinary planning. Concise statements were included of what students could know and do in the major content areas of health education and in the areas where health education related to values education, basic education, and career education.

2. Psychomotor-cognitive objectives. The Technical Education Research Center (1970) published a report on the development of a comprehensive profile on the biomedical

equipment technicians who spent at least 50 percent of their time repairing and maintaining biomedical equipment. The report recommended that all such training programs emphasize skills in electronics, troubleshooting, and repair; secondary emphasis should be on mechanics, electromechanics, communication skills, and administrative-management skills.

3. Objectives for subject areas. Several studies dealt with objectives for specific health occupations areas. For a junior college course in dental assisting, Starkweather (1971) selected instructional objectives from materials submitted to the Curriculum Laboratory at UCLA. Arranged by major course goals, the objectives were presented as samples that could be used where they corresponded to the skills, abilities, and attitudes instructors wanted students to acquire. The objectives were presented as models for instructors to translate other units into specific measurable terms.

The National Highway Traffic Safety Administration (1977) published a basic training program for emergency medical technicians which included work performance addressed by the course, student qualifications, student performance objectives, course structure, and instructional strategy.

Instructors must use accreditation standards in the development of objectives. In the area of nuclear medicine technology, the Technical Education Research Center (1975) noted that the purpose of the developed curriculum guide was to assist administrators and instructors in establishing programs in this area that will meet accreditation standards of the American Medical Association Council on Medical Education. The outline included student performance objectives.

Objectives for levels in nursing were addressed in two issues. Six workshops, composed of 799 participants representing 4[illegible] agencies were conducted and reported by the National League for Nursing (1970). They included presentations on the use of objectives in developing the curriculum, determining levels of progression, and identifying objectives. The National League for Nursing (1971) later reported on the second phase of a three-year curriculum development program in which workshops were conducted to identify course objectives in relation to level objectives; select subject matter and learning experiences appropriate to achievement of course objectives; identify resources and teaching methods; and introduce concepts of evaluation of the curriculum, courses, and students.

Reed (1973) reported sessions which involved all levels of personnel in the utilization of helping skills to care for residents in nursing homes. Each session was planned so

participants had opportunities to practice the skills of attending, responding, planning, and assessing. The results indicated significant increases in the following levels of functioning: attitude toward elderly people and themselves, discrimination skills, and responding skills. Positive changes were noted in the participants' attitudes toward their jobs and increased knowledge concerning biological and psychological changes that occur in the aging process.

Curriculum guides organized from the four levels of performance in occupational therapy were reported by the School of Allied Health Professions (1972) at The Ohio State University. The curriculum for the levels of aide, technician, therapist, and consultant included an introduction as well as curriculum modules. The introduction specified the job description, identified prior learnings, gave suggestions on methods of assembling the modules, and listed affective objectives to be included in each curriculum. The curriculum modules, described as units of learning which required comprehension and/or application of information, had several modules containing a performance objective, related activities, methods for achieving objectives, suggested teaching strategies, suggested evaluation techniques, and suggested instructional media.

EXAMPLES OF CURRICULUM GUIDES

The research reported in this section pertained primarily to curricula/course guides in health occupations education.

Secondary

Junge (1975) conducted a project whose intent was to address the need for validated instructional materials in secondary vocational health occupations education. Teacher coordinators in Texas health occupations cooperative training programs identified behavioral objectives; an experimental instructional module on orientation to the health care delivery system was developed and pilot tested by students enrolled in health occupations education. Three products were produced: a teacher implementation plan, a student record book, and assessment instruments. The module was designed for student use with the instructor acting as a facilitator and included units on health care facilities, a history of health care, agency organization, health care personnel, and major health problems.

Jaeger (1976), in order to guide school personnel responsible for curriculum development, developed a course outline designed to prepare high school students as assistants in a doctor's office.

The guide was divided into the areas of medical secretary, medical technician, and patient management. Each area was divided into units according to the specific skills to be learned. Lesson plans included time required to complete the lesson, objectives, a suggested instructional procedure, unit outline, a discussion guide and demonstrations, references, and suggested teaching aids.

A curriculum guide to serve as a statewide model for nursing assistant programs in the public schools in Virginia was developed by the Division of Vocational-Technical Education at Virginia Polytechnic Institute and State University (1975). It included eleven units of instruction, sample lesson plans, evaluation/assignment suggestions, and sources for various teaching aids.

The Battelle Memorial Institute (n.d.b) developed a project for a high school practical nursing curriculum. The objectives in this project were to investigate current and expected content of the occupation and determine attributes employers look for. The procedures included a survey of six hospitals, four nursing homes and one public health agency as well as the rating of eleven groups of tasks according to desirability, importance, and prior knowledge. Data revealed that employers assess entry-level practical nurses in terms of amount of education, job skills, and personal qualifications. Guidelines were developed in the following areas for practical nursing programs: general program characteristics, program organization, student selection, curriculum, facilities, and policies for cooperating agencies.

Postsecondary

In order to assist teachers in developing curricula, the Gregg/McGraw-Hill Company (1972) published an aid consisting of an instructional program planning matrix and flow chart. The guide contained a synopsis for each program for health occupations education, a detailed description of each of twenty instructional units, and a description and prototype of performance goals.

The issue of providing open entry/open exit in curriculum guides was addressed by Gilligan and Sherman (1974) in a study of licensed practical nurses, nurse aides, and homemaker-health aides. The design provided modules of instruction to provide exit points for job titles leading up to the licensed practical nurse level.

Bechtel et al. (1975) developed six curriculum outlines adapted to the personnel development needs of both the rural community and large metropolitan hospitals. The guide also stressed the importance of the learner's direct involvement in all levels of curriculum planning and implementation.

The difference between a course of study and a course syllabus was discussed by the New York State Education Department (1973) in a statement of the minimum course content acceptable for state credit. The syllabus on dental assisting was not intended to be used as a course of study; however, its contents were to be incorporated in a course of study developed to emphasize local needs and conditions. The syllabus indicated that a course of study should contain performance objectives defining what the student could do, under what conditions, and at what proficiency level. The New York State Education Department (1974) also developed a syllabus for preparing nurse's assistants designed as the minimum course content acceptable for state credit. It had, as its primary objective, the employability of graduates and also required a program of supervised experiences in hospital, clinic, and nursing home environments.

Supervised clinical experience and/or practicums in agencies in the health care delivery system as an integral part of course requirements were stressed in several curriculum guides, for example, in nuclear medicine technology (Technical Education Research Center, 1975); in medical laboratory technology (Miami Dade Junior College, 1971); in dental assisting education (Division of Vocational Education, October, 1968); in emergency care of the sick and injured (National Research Council, 1968); and in human services technology (Cowley, 1976).

A guide for writing contractual agreements in instances of hospital-college affiliation was developed by the Saint Louis Community College (1975) in a curriculum for a two-year post high school curriculum for medical radiology technology. The guide contained descriptions of twenty-two courses. Buatti and Rich (1977) conducted a project to develop a curriculum for a two-year nuclear medical technology program based on a working relationship between the community college, the university, the health center, and the hospital. A general description of the medical imaging and radiation technology core program was included in their project along with an explanation of the cooperative relationships of the core program with the community college and hospitals.

Curriculum guides which stressed planning and management information, sequencing, lesson plans and/or student guides were reported by several researchers. For medical record personnel, Clark (1975) developed a curriculum management guide to aid

teachers through improvement of student performances by improved administration and program management. The guide documented a suggested systematic approach to professional and vocational curriculum management through a detailed management model. The National Highway Traffic Safety Administration (1977) published a course guide to aid the course coordinator in planning and managing a basic training program for emergency medical technicians. One section covered course planning considerations, including suggestions for scheduling the lessons, class size, required materials, and cost estimates. A student guide was also published by the National Highway Traffic Safety Administration (1977) to aid students enrolled in an emergency medical technician training course. For nuclear medicine technology, Hunter (1975) detailed forty-four courses in the program and described the interface of procedures in nuclear medicine technology with studies in basic physics, social science, and English.

Several researchers reported field and/or pilot testing of curriculum guides. Fucigna et al. (1973), in an effort to upgrade the performance of ambulance personnel and establish standards for training and licensing individuals as emergency medical technicians, developed and pilot tested a basic training course in emergency medical care. The National Highway Traffic Safety Administration (1973) developed a guide to provide a standardized approach for providing training in emergency medical care for first responders to traffic accidents. The guide focused on the practice of crash-related and life-saving skills.

A field test of a health occupations curriculum guide was reported by Schriber (1978). The purpose was to not only field test the existing materials but also to have content experts and development specialists review the materials. It was felt that the field test project and resulting revised guide would contribute significantly to the usability, content, accuracy, and managability of the guide. Miller (1978) wrote eight technical content modules in health occupations education. Using guidelines and a standard format mutually agreed upon by participating universities and the Bureau of Vocational Education of the Pennsylvania Department of Education, a selected staff member was to develop the modules to the point of readiness for field testing.

Several curriculum guides included statements on measurement and evaluation of student performance. The School of Allied Medical Professions (1972) at The Ohio State University, in a curriculum guide for occupational therapy, developed curriculum modules for four levels of practitioners. Each module contained a performance objective, methods for achieving the objective, and suggested evaluation techniques. Recommendations for measuring student achievement were included in the course guide for

emergency medical services (Cleven, 1973). A change in philosophy in pharmacology instruction for paramedical students which required a change to nontraditional methods of instruction was presented by Kernelian and Kerns (1974). The course consisted of five specific and one student-designed unit. The examinations were criterion referenced, requiring 85 percent mastery. The results of the use of nontraditional methods of instruction indicated a positive change in student attitudes and grades.

Guides with a Single Content Focus

The guides described below were directed toward the role expectations of program completers.

1. Dental assistant. The Public Health Service (1968) described a curriculum for dental assistant for three public health centers. The ten-month curriculum was presented on a daily schedule with two hours of study and five hours of practical application. The ten major content areas included clinical application, laboratory and technical application, and on-the-job training in a private office.

2. Emergency medical technician. Developed by the National Highway Traffic Safety Administration (1974), a crash victim extrication course included the purpose, mission, and duties of the emergency medical technician; extrication with special attention to the classification of equipment and the extrication system; role expectation at the accident scene; and functions for gaining access, disentanglement, and emergency care procedures.

3. Environmental Health. Guidelines for the education of environmental health personnel at the associate and baccalaureate levels and an example of the curriculum at Ferris State College was developed by Fleming (1976). The curriculum satisfied the accreditation council guidelines.

4. Medical Office Assistant. Savage and Daughtry (1975) developed guidelines for the development and implementation of programs for medical office assistants; two curricula which offered a four quarter program for a diploma, and a six quarter program leading to an associate degree in medical assisting. This comprehensive framework around which the teacher could develop courses of study included suggested course outlines with behavioral objectives and outlines of instruction. Course outlines were presented on all phases of medical assisting including medical office practicum.

5. Nursing Assistant. McClelland and Dunkleman (1979) developed a manual for providing college education for nursing assistants to replace on-the-job training. A course

description and implementation guidelines, a module time-table, pre-tests, instructional materials, tests, and a nursing assistant course syllabus were included.

6. School Nursing Curriculum. Miller (1973) developed a curriculum designed to introduce registered nurses to school nursing. The project provided for testing of the curriculum through lectures, seminars, and study groups as well as evaluation through pre and posttesting. Specific content areas included developing skills for health assessment; implementing health education programs; organizing, administering, and coordinating school health programs; and continuing preparation in school health.

7. Occupational Safety and Health. With the enactment of the Occupational Safety and Health Act (OSHA) of 1970, the need for curriculum materials in industrial safety and hygiene was evident. Gourley (1973) developed a manual to provide information to administrators and instructors on a curriculum to be used in community colleges in North Carolina. Based on role expectations, the program contained four curriculum levels for use in the development of required courses, occupational safety and health technology electives, and social science electives.

8. Physician Assistant. Wake Forest University (1971) published a guide which described a physician's assistant training program organized in three phases: a six month basic course in clinical and bioscience principles, a six to ten month period of intensive training in patient evaluations and special procedures, and eight to twelve months of supervised practice.

9. Entry Level Health Workers. A curriculum for the training of entry-level health workers (nursing aide, nursing assistant, or basic health care worker) was developed at the Miami Dade Junior College (1974). The curriculum, organized in two modules for a six-week period of time, focused on the knowledge, skills, and attitudes required for employment in clinics, family health centers, hospitals, nursing homes, and extended care facilities.

RELATED COURSE WORK

Several curriculum development projects concerned the sciences as related courses.

Gurney and Kintgen (1975) compiled twenty-one approaches to be used in health occupations education. They included core content (core course in the dental area), interdisciplinary core

courses, and integrated science curriculum for multiple health careers. The development of a bio-medical sciences core at Weber State College was described by Sesney et al. (1977). The intent of this curriculum for introductory level allied health students was to integrate physics, chemistry, anatomy, physiology, and microbiology as they relate to the human body.

A syllabus package for two health-related science courses, developed by Cohen (1976) included a two-semester course designed to fulfill the basic human biology requirements of students enrolled in two-year allied health career programs and a one-semester course for students enrolled in one-year programs. The content included student behavioral objectives, methodology, student activities, and evaluation. A revised chemistry program for nursing and allied health students described by Stanitski and Sears (1975) did not require a high school chemistry prerequisite. The rationale for the revision pointed toward the use of biochemically significant substances and phenomena as a framework to describe chemical principles. Chaney (1974) discussed the Denver Collaborative Training Program and a ten-week course outline for physics instruction in radiologic technology. Emphasis was on identification of core topics, preparation of quality instructional materials, and such innovative teaching strategies as computer assisted instruction and video-tape presentations.

Community college administrators and faculty in anatomy, physiology, chemistry, physics, and microbiology attended a workshop to redefine, modify, and develop science concepts for a core curriculum in the education of allied health practitioners. The project, reported by the Coordination Council for Education in the Health Sciences for San Diego and Imperial Counties (Coordinating Council, 1970a) included the following activities: visitations to clinical areas utilized in teaching; and collecting task analyses of the entry level tasks for medical assistants, dental assistants, radiologic technologists, inhalation therapists, licensed vocational/practical nurses, registered nurses, and physical therapist assistants. On the basis of the analysis, the committee proposed instructional units in anatomy and physiology, microbiology, physics and math, and chemistry. A second workshop report (Coordinating Council, 1970b) dealt with an integrated science core curriculum developed to meet task requirements of selected allied health practitioners. The report had several facets: It described concerns identified by the committee such as administrative support and faculty involvement. It identified the need for employing agencies to redesign certain task descriptions and job slots for the entry health worker. It recommended that evaluative data in the form of longitudinal follow-up studies be instituted.

EXAMPLES OF CORE CURRICULA

Lewis (1970) identified major findings, promising developments, strategies, and methodological strengths and weaknesses in curricula designed for training dental assistants, dental laboratory technicians, hospital attendants, nursing aides and assistants, medical and dental technicians, and practical or professional nurses. The research indicated that although a number of curricula are available, a major shortcoming is the general lack of a core or cluster curriculum.

Barton (1974) shared an example of a core curriculum which specified program design for health occupations education at the secondary school level. Cantwell (1974) described the Galveston plan implemented by the University of Texas Branch School of Allied Health Sciences and Galveston College. Utilizing the core approach in instruction in its cooperative program, the plan provided academic and clinical experience for the health care worker by requiring that all students have a core year of education before making their final career choice. In the first semester, the morning was spent in college in courses such as anatomy, English, and psychology and the afternoon at the hospital where students became part of a health care team and performed entry level tasks.

The Division of Associated Health Professions, Health Resources Administration (1975) reported a statewide core curriculum, career ladder, and challenge system in South Dakota. The project involved coordinating associated health and nursing education to achieve a more systematic production and utilization of human resources in health. An implementation study determined that out of sixty-five programs, ten institutions would offer the primary core curricula in eighteen different programs.

Kishkunas (1967) developed a model health occupations training program in Pittsburgh. Sixty-one tasks common to nursing aides and assistants, practical nurses, and surgical technicians were used as the basis of the core curriculum. A handbook of step-by-step basic nursing procedures was developed during the course. On performance tests, it was determined that groups in the demonstration program had a significantly higher mean score than the fourteen students in two control groups in the eight-week conventional program; the experimental groups' scores were consistently high on written tests. Kishkunas concluded that the shortened program was successful and that the model was suitable as a basic design for other paramedical training programs.

INNOVATIVE APPROACHES

Career Mobility

Gurney and Kintgen (1975) compiled twenty-one courses in the following eight areas:

- Career mobility - modified licensed practical nurse (LPN) programs for employed nurse aides, modified LPN programs for nurse aides employed in multiple sites, a three-level approach to practical nursing, an LPN/ADN transition program, a statewide vertical mobility program in nursing, an articulation program in nursing, and a statewide career mobility guide

- Continuing education - coronary care nursing for practical nurses

- Core content - core courses in the dental area, interdisciplinary core courses, and an integrated science curriculum for multiple health careers

- Developmental education - a practical nurse summer study skills program

- General education adapted for health careers - a biomedical interdisciplinary curriculum project and health careers techniques and applications of chemistry

- Individualized instruction - individualized instruction in an adult nurse aide program and programmed materials in a nurse aide course

- Secondary school programs - secondary medical laboratory assistant program, high school practical nursing, and learning and volunteering

- Teacher training - teachers for health agency nurse aide programs

Target Groups

A course prepared by an instructor and curriculum development specialist at the Minnesota Work Opportunity Center (Stroup and Anderson, 1969) was designed to train dropout and/or hard-core unemployed youth for occupations as aides or orderlies in hospitals and nursing homes. A personal orientation was prepared for each student enrolled. After demonstrating skills and self-confidence, the students received practical experiences in the University of Minnesota hospitals as part-time employees.

An institute for health professions faculty, during which participants developed four curriculum models, was arranged by the Association of Neighborhood Health Centers (1975). The curriculum models were intended to serve as examples of concepts, principles, and exercises which could be utilized in preparing health professionals for inner city work. The folowing modules were included: Introduction to Outcasts, Interdisciplinary Health Model, A Curriculum Design for Health Service Practitioners, and A Model for a Continuing Education Faculty Workshop on Inner City Ambulatory Health Centers.

Silverstein et al. (1971) identified the role of citizens and/or nonprofessionals in health occupations education. Summaries of mental health training projects conducted with grants from the Experimental and Special Training Branch of the Division of Manpower and Training Programs were prepared. The projects were significant in that they were developed for academic and nonacademic settings, subprofessional and nonprofessional training, and a variety of functions including service, teaching, research, and prevention. The summaries were listed in thirty-three sections including those for mental health workers; college, hospital, community agency, or model cities personnel; citizen participation; child care personnel; nursery school teachers for emotionally disturbed children; specialists in sex, marriage, and family; personnel in crime and delinquency; alcoholism and drug abuse personnel; and geriatric workers.

Innovative Approaches to Programs or Objectives

Watt (1971) conducted a project to develop an interdisciplinary curriculum in the improvement of hospital techniques for college students in health related majors. The curriculum stressed using elementary industrial engineering methods for simplifying work and saving labor and applied them to the complex problems of the hospital environment. The need for work analysts and markets for the curriculum were presented.

Cooper and Magisos (1976) developed a set of fifty-five curriculum packages designed to meet the job related metric measurement needs of students preparing to be homemakers or health aides. The package included objective-based evaluation items with answers to the exercises and tasks to facilitate experience with measurement instruments, tools, and devices used in the occupation and job-related tasks of estimating and measuring.

The Public Health Service (1966) and the Visiting Nurse Association in Detroit published a coordinated home care manual designed as a source of information for the planning, organization, implementation, and evaluation of home care programs. One section dealt with additional home care services

such as education, friendly visitor, meals, transportation, podiatry, psychology, recreational therapy, and work at-home program services.

The Dade County Public Schools (1972) described an authorized course of instruction in basic skills for health occupations. Designed to develop selected skills common to many health occupations, the forty-five hour course included two innovative approaches: selected theoretical knowledge correlated with laboratory periods of applied practice in a simulated clinical situation, and student involvement with approximately three-fourths of the class time devoted to laboratory experience.

The Human Resources Research Organization (1972) developed a manual with information for administering a medical training program. Innovative parts of the curriculum included programmed instruction and self-scoring practical exercises; student evaluation techniques and a self-contained correspondence course; criterion test scoring procedures for the examination in each instructional package; and a key for scoring the practical exercises that required students to abstract sample medical charts.

SPECIAL SKILLS

Cates (1977) presented spcific recommendations for curriculum modification of undergraduate allied health programs that included skills related to serving the needs of aging individuals. A project to plan for the care of the aged also was developed by Smith (1977) whose objective was to plan for training needs of nursing home personnel with special attention to quality of life for the residents, their physical needs, and conditions of the facilities. A state-wide training plan was intended to articulate competencies, content, communication, coordinated delivery systems, evaluation methods, and career ladders. Procedures included the compilation of a directory of training programs, resources, and materials. Task forces of representative groups engaged in training were appointed. Other elements of the program were that it should have the following features: be available near the home base of the aide, be delivered early in the aide's employment period, be developed within the context of the nursing home and the total nursing home staff, and be tied to other training to provide for upward mobility for the aide.

McKnight et al. (1972) described a revision of a compliance safety and health officers course. The job was analyzed in depth in accordance with Occupational Safety and Health Administration (OSHA) standards. A listing of over 1,700 possible violations

of OSHA standards was prepared. Specialists in occupational safety and health then evaluated each violation in terms of seriousness based on the likelihood of hazard and probability, severity, and range of its effect. Performance objectives and a four-week course were developed which included an instructional paralleling sequence in which activities were performed, an intermingling of "compliance" and "standards" instructions, and realistic role playing exercises to provide practice for compliance safety and health officers in dealing with employers and employees.

A course coordinator's guide published by the National Highway Traffic Safety Administration (1974) suggested using simulated casualties for students to learn removal problems such as entry techniques, emergency medical care, stabilizing and securing techniques, and techniques of removing the victim in different positions from the vehicle; to demonstrate forcible entry, disentanglement, and safety techniques; and for students to acquire a basic understanding of how to evaluate situations, gain access to victims, and release victims from entrapment. To achieve the skills, students were provided practice and skill training in entry, emergency medical care, disentanglment, and removal.

CURRICULUM MATERIALS

INTRODUCTION: SOURCES FOR OBTAINING CURRICULUM MATERIALS

After the instructional strategies have been developed, decisions must be made concerning the selection of curriculum materials which will assist the learner in achieving the level of competency specified in the objectives. Teachers must know how to use curriculum materials and what their sources, availability, and requirements for use are.

Southern Illinois University (1971) reported on a project for developing behaviorally-oriented learning materials by allied health teaching personnel. Four workshops were held in four geographical locations in the state Ninety-four teachers and administrators from twelve health-related occupations attended these workskops designed to provide information and instruction in developing learning materials for use in classrooms and laboratories. Activities included analyzing selected health-related occupations, writing behavioral objectives, preparing learning experiences from behavioral objectives, and modifying nonbehavioral learning materials to behaviorally-oriented learning materials. An evaluation of the participants indicated that the majority either equaled or exceeded the level of acceptable performance.

Cooper (1969) described the benefits and problems of sharing resources in medical and allied health education. The report included a historical background of the use of audio-visual materials and described primary uses of the materials in health science education as well as the facilities, equipment, and capabilities required to support their extended use. The potential role of the Biomedical Communication Network was discussed and a typical learning resource center in a medical school was described.

Annotated listings

The Northwest Regional Laboratory (1971) published an annotated bibliography which listed curriculum materials available from federal agencies for health occupations education. It included dentistry, medical laboratory technology, nursing, rehabilitation, radiology, opthomology, environmental health, and mental health technology. Instructional materials were classified by the categories of basic education, related education, guidance and counseling, teacher education, and disadvantaged and handicapped.

The Bureau of Adult, Vocational, and Technical Education (1971), Office of Education provided a listing of curriculum materials for health occupations education available from public education agencies. The purpose was to provide information developed by the various states. Occupational resource materials that applied to all areas of vocational education were listed. Similar information was also reported by the Curriculum and Instructional Materials Center (1973) of the Oklakoma State Department of Vocational and Technical Education.

A compilation by the National Center for Research in Vocational Education (1972) presented over 150 resumes of instructional materials in health occupations education which appeared in Abstracts of Instructional Materials in Vocational and Technical Education (AIM) from 1967 to 1971. They covered a broad range of health occupations, e.g., dietetics, nursing, paramedical occupations, health personnel, and pharmacy. Microfiche or xerox reproductions of the full texts of documents are available from the original sources or from the ERIC Document Reproduction Service. The same information in Abstracts of Instructional Materials from 1972-75 was compiled by Eshelby (1976).

A bibliography by Solon (1975) was designed to assist teachers and high school students in selecting printed and audio-visual materials. One hundred fifteen documents were included for dental, nursing, and medical assistants; medical laboratory, rehabilitation, physical therapy, radiologic, health care, respiratory therapy, mortuary, pharmacy, recreational therapy, and geriatric aides; and practical nurses.

In a survey of medical and allied health libraries in North Dakota the goals and plans for the learning resources and science library for the state's expanding medical education program were defined. Bruce (1973) reported that part one of the survey determined the degree of congruence between the aims and goals of medical education programs in North Dakota and generally accepted guidelines for medical library development as identified by the Association of American Medical Colleges. Part two involved onsite evaluations of predominantly medical and health-related library facilities in the state. Library resources, library services, physical facilities, and personnel were evaluated. The data revealed that the greatest need was for recruiting qualified library personnel. The recommendations included library development to ensure access to basic library services for every health professional in the state and the establishment of a North Dakota health science information network.

Newman (1974) studied the problem of adapting available curriculum materials to local situations. Despite many options available, developers of curriculum materials must recognize the valuing dimensions of decision-making as the users make a choice

based on budget, personnel, facilities, and experience. Developers must decide how to match the principles of curriculum materials development with the perceptions and constraints of the users. Newman suggested that one method of solving the problem was by establishing a faculty ad hoc committee to make recommendations for developing specific instructional media without immediate reference to the total curriculum development program. Although materials could be sorted by using the criteria of degree of complexity and assumed expertise of the user, creative faculty could use the materials in several situations.

PRINTED MATERIALS

Three programmed instructional materials reported in this section originated in Los Amigos Hospital in California. Two were on anatomy and one (McDaniel, 1968) related to training physical therapy aides. The purpose of the McDaniel study was to develop a standard method of training physical therapy aides using programmed instruction. The procedures included the following steps: the refinement of a two-month curriculum established in the Los Angeles County Hospitals; the development of behavioral objectives; the writing of programmed instructional materials in cognitive areas; and the development of tests to evaluate curriculum and materials. Data were obtained from a class of trainees and were compared to data on previous trainees who had been taught through formal group methods but who had no programmed instruction and on trainees who received on-the-job training only. The results indicated the following: those who had been taught through formal training acquired more knowledge than those with on-the-job training only; there was no significant difference between formal group training with programmed instruction; however, formal group training with or without programmed instruction required 35 percent less instructor time. The researcher recommended that programmed instruction should be integrated into formal training programs since it took less instructor time, provided for flexible scheduling for large or small groups, and aided in standardizing content.

Kristy and McDaniel (1968) developed a programmed text for use in a hospital or junior college program. Their objective was to provide basic information, the normal structure and functions of the nervous sytem, which physical therapy aides need to know. The text included four units: introduction to the brain and nerves, the brain, the spinal cord, and the peripheral nerves. A section addressed to the instructor contained information about field testing, enrichment, and behavioral objectives. The materials also included a pretest and a posttest. The authors

suggested that the teacher should be a registered physical therapist or a nurse and that some demonstration sessions should be used with each unit.

Putnam and others (1970) reported on the development of a programmed text on the major systems of the human body, including the circulatory, respiratory, and urinary systems. The book also included illustrations suitable for reproduction as overhead transparencies.

Laughlin (1977) described a project to redesign courses on organic and biochemistry (using the Personalized System of Instruction developed at Georgetown University) and on modifications needed for implementing them in a community college. Short units of instruction that could be mastered by any student were developed in a self-paced format. Written units were supplemented with audio tapes. Since the objective was mastery of the course material, students could complete the course expectations in less than the usual time (ten weeks) or they could extend completion time to more than one quarter.

Holcomb and Milligan (1974) stated that the development and extensive use of self-instructional materials in clinical rotations have the potential to improve educational activities. They suggested that allied health educators should consider self-instruction teaching strategy as a primary method.

AUDIO-VISUAL AND AUDIO-TUTORIAL MATERIALS

Niles (1970) reported on "Nursing Dial Access," a taped library available by telephone to professional nurses in Wisconsin, developed at the University of Wisconsin. The program, available on an around-the-clock basis, provided short tapes on such subjects as nursing care in emergency situations, new procedures and equipment, recent developments, and legal aspects. The tapes can be used from any telephone, free of charge, to Wisconsin callers. A survey of the users indicated that the program was an appropriate way to provide certain types of information, that nurses accepted this system of information retrieval, and that the program had been successful in meeting the needs of nurses outside of urban areas.

Two studies were reported which used the audio-tutorial approach to learning. Mentzer (1970), at the Washington (Pennsylvania) Hospital School of Nursing, developed a laboratory manual as part of an audio-tutorial approach to laboratory work in a life science course for student nurses. The forty-four exercises which were developed included basic techniques of microscopy,

microbiology, electrophysiology, routine biochemical analysis of blood and urine, and microscopic examinations of prepared histological sections. A number of experiments were included involving enzymatic digestions and radiation effects, and dissections of the heart, kidney, digestive, and respiratory systems. Information also was included on supplies needed for permanently equipping each audio-tutorial booth and additional needs for each exercise.

An audio-tutorial method of instruction also was developed for nursing and other students in the health or medical fields at the Kingsborough (New York) Community College. Muzio (1974) reported that the problems of underprepared students and the time constraints caused by students enrolled on a part-time basis were factors that caused a need for the program. The project involved a two-course sequence on human anatomy and physiology. Independent and group activities were utilized, including a study guide, taped lessons, small and large group sessions, and performance tests for each module. An independent learning center was available for student use. The researcher concluded that the audio-tutorial approach was a suitable method for fostering individualized learning for students who have experienced academic difficulty.

Two innovative uses of visual and audio-visual materials were cited in the literature. Wilhelm (1973) reported on an inservice training program for nurses designed to provide knowledge of current psychiatric trends. The main purpose was to orient the participants toward a humanistic approach in patient care. Visual aids were used extensively to this end. Spicer (1975) described the use of a mobile continuing education program. A van equipped with audio-visual aids and a lending library was used by a member of a nursing faculty to assist practitioners in northern Arizona in meeting their professional development needs.

LEARNING PACKAGES

As part of the Allied Health Profession Project at UCLA, two volumes were developed on nursing skills for allied health services. Instructional materials were presented on 36 units based on 184 activities designated by a national survey as those which were performed at all levels of nursing through the associate degree level. Volume I (Wood, n.d.a) was on units 1 to 20; Volume II, (Wood, n.d.b) covered content areas 21 to 36. Each of the units included student directions, performance objectives, vocabulary lists, pre and posttests, performance tests, checklists, and illustrated instructional materials. These packages were adaptable for on-the-job training, adult education, and/or staff development programs.

As part of the UCLA Allied Health Professions Project, instructional units for the medical transcriber also were written. Three study guides were developed for teaching knowledge and skills required for medical transcribing. The units included sketches to illustrate the material and space for the student to fill in the questions. The material by Gosman (1972a) had thirty-two units which included material on the skeletal system, disorders of the skeletal system, and muscle disorders. The package also included thirty-one audio exercises for use with a cassette, nine transcription exercises to be completed by the student, and answers to the measurement items. Gosman (1971) also developed materials on systematic circulation and symptoms, tests, and disorders of the heart. Eighteen audio exercises for use with a cassette, nine transcription exercises, and answers to the unit questions were developed. In addition, Gosman (1972b) focused on the anatomy and disorders of the respiratory system and developed fifteen audio exercises for use with a cassette, seven transcription exercises, and answers to the questions for student use.

A comprehensive project on metric education (Cooper and Magisos, 1976) developed fifty-two packages for metric instruction in different occupations. The packages were intended for students who already knew the terminology of an occupation, measurement terms, and measurement tools. Each instructional package included performance objectives, learning activities, supporting information, and suggested teaching techniques. The package also listed evaluation items based on objectives, answers to the exercises and tests, a list of metric materials needed for the activities, references, and a list of suppliers. Each of the learning packages had five instructional units. Unit one introduced the learner to the metric system of measurement and provided informal hands-on experiences. Unit two provided experiences with occupational measurement tasks. Unit three focused on job-related metric equivalents. Unit four provided experience with recognizing and using metric instruments and tools in occupational measurement and in comparing metric and customary measurement instruments. Unit five was designed to provide students with practice in converting customary and metric measurements. Thus, in Metrics for Dental Assistants, learning activities, hands-on experiences, and conversion problems related to the occupational metric expectations for dental assisting were provided. In Metrics for Licensed Practical Nurses, learning activities were designed for licensed practical nurses with all of the information and hands-on experiences in metric measurement and conversion directed toward this occupational area. In Metrics for Nurses' Aides, the activities and practice opportunities were directed to the application of metric knowledge, skills, and conversion needed by nurse aides. In

Metrics for Homemaker and Health Aides, learning activities in measurement, metric system, and conversion needed in the occupation were included.

Several learning packages were targeted for Spanish-speaking students in kindergarten through the sixth grade. The curriculum booklets published by Educational Factors, Inc. (1976) in the Discover the World of Work series included a teacher's guide and student materials. The school nurse unit, one of twelve curriculum units designed to develop career awareness in migrant and nonmigrant Spanish-speaking students, was aimed at three reading levels. Each booklet was divided into three sections: a teaching unit, which included a listing of occupations related to the school nurse at the entry and professional levels, unit objectives, and major activities; two student activities; and criterion-referenced tests. All information in the booklets was presented in both English and Spanish. The following booklets were designed for students at the three reading levels:

- Level A provided full-page pictures corresponding to the sequence of a story and a play presented in the teaching unit.

- Level B provided text and illustrations with discusssion questions directed to the Spanish-speaking student at the beginning reader level.

- Level C provided a story and a play in the teaching unit and a text and discussions during student activities, directed to the Spanish-speaking student at the advanced reading level.

As professional organizations turned their attention toward professional development, learning packages were developed to meet the needs of practitioners resulting from technological change and the establishment of professional standards. Two such efforts are reported below.

The National Committee for Careers in Medical Laboratory (1972) described seventy-two self-study lectures with 600 slides and printed text. The intent was to help medical laboratory personnel keep up with developments in their field.

Adams (1971) developed self-contained study units in order to address a particular nursing problem, a specific illness, a broad content area in nursing, and/or a nursing technique. The author indicated that continuing education is imperative if nurses are to keep abreast of the technological advances operating to change the role of the nurse.

MODULES

Prior to developing instructional modules one must consider the procedures to be used in the development of introductory information to accompany each module, a format for the module and the information/materials to be included, field testing and revising, mass production of the modules and materials, student and teacher packets, marketing channels and/or dissemination, a module to introduce teachers to their use, a method for providing information on the modules to target groups, and awareness/instructional activities for teachers to learn how to use the modules. Two researchers described these procedures in depth. Hole (1977) reported a project whose intent was to identify needed modules in programs for home-health assistants and to develop a minimum of three modules for field testing. The procedures included, among other things, a review of current literature to determine the need for curriculum materials for the home-health management assistant programs. Each learning experience included concepts, generalizations, terminal objectives, instructional objectives, and learning objectives.

Fielding (1976) also reported a related curriculum development project. Its first goal was to develop and field test seventy-two individualized instructional modules in four occupational areas (eighteen of the modules were in health occupations education). The second goal was to set up a media center to mass produce and disseminate individualized materials.

Modules to be used with learners with special needs also were reported. Central Michigan University (1973) reported a project during which a health occupations cluster guide for teachers was developed. The procedures included obtaining task analysis information on the entry level occupations available in Michigan. The guide described six tasks common to the health occupations cluster, forty-eight tasks for seven selected entry level occupations in health care, eighteen tasks for three selected entry occupations in child care, and twenty-five tasks for selected entry occupations in hospital housekeeping. The information presented in each module included behavioral task knowledge/task skills, instructional materials, and basic information for cooperative teaching. Information on instructional materials codes indicating probable learning approaches and a task-related competency code also were included.

A student manual on a one-year introductory program in health careers for tenth grade students was reported by Rosenthal and Agran (1971). The document, part of an individualized integrated curriculum on the health care system, included options for work study and cooperative education. The manual was divided into three modules: module one provided an overview of the

occupation, its problems and practices; module two described eight fictitious case histories which introduced students to the functions and responsibilities of health care personnel; and module three presented three units of preparation for field work at a hospital. In addition, suggestions for varied activities including open-ended problem-solving situations and illustrations designed to dispel stereotyping were presented.

A module for orientation of secondary school students to the health care delivery system was reported by Junge (1975). The module, designed to be used by students with the instructor acting as a facilitator, was divided into eight units. A teacher implementation plan included transparency masters and a script for a slide-tape presentation. A student record book included information sheets, vocabulary lists, and study questions. Assessment of learning was provided through pre and posttests.

A similar project was reported by Miller (1978). The intent was to develop eight technical content modules in health occupations in communications, ethics, structure and function, and health careers.

Three reports dealt with constraints in module development. One problem with self-paced materials - the availability of the hardware to accompany soft-ware and student utilization - must be considered. A description of one approach to solution of the problem by the Air Force was descried by Raynor (1976). The author reported that the fifty self-paced modules that made up the course for paramedical equipment technicians were randomly sequenced to reduce capital investment in training equipment.

Recognition of the need to provide for varying learning styles in instructional strategies and curriculum materials was identified by Baldwin and Tucker (1976). They developed a multimedia system to teach professional nurses skills needed to manage the hypertensive individual. The approach had three phases: planning and development, evaluation and modification, and production and packaging. The authors indicated that due to the varied education and experience background of nurses, the module should provide alternate routes through the learning sequence.

Another problem in the development of modules was identified by Swendsen and others (1977). They described strategies used to implement modules in an undergraduate nursing program. Goals for modularization were described and the problems and constraints encountered during the implementation were discussed.

In summary, the decision-making process (determining options, identifying criteria, stating rules, and choosing an alternative) must be utilized in choosing curriculum materials. Users must determine whether to focus on teacher-made or commercially

prepared materials. To choose the former requires knowledge and skills in the development of materials. To choose the latter, certain constraints and criteria must be considered and sources of the materials must be identified. In either case, educators must take into consideration the degree of concreteness-abstractness, learning styles, and capabilities of users, and the organization of the materials.

IMPLICATIONS FOR RESEARCH

Four categories of curriculum materials were discussed: printed materials, audio-visual and audio-tutorial materials, learning packages, and modules. The following implications for research were identified:

- The feasibility of learning resource centers used to accommodate learners with special needs, part-time students, and teachers who need assistance in the development, utilization, and evaluation of curriculum materials should be studied.

- No research was identified in health occupations education which determined the learning style of individuals in order to write prescriptions for learning in relation to curriculum materials.

- The educational gains for all learners - target groups, adult learners, and those with different learning styles - were not identified in the research reported.

THE LEARNING PROCESS AND STRATEGIES

INTRODUCTION

A maximally effective learning process is essential if students with differing abilities, interests, and learning styles are to be successful in health occupations education programs. The learning process, which is ultimately dependent on the interaction between the student and the teacher, includes the variables of curriculum, instructional methdology, the physical environment, and available options for presentation of information congruent with the learning styles of individual students.

In recent years, much attention has been given to the fact that students learn in different ways. The existence of individual styles of learning is generally well recognized. This recognition suggests the need for more innovative approaches to the teaching-learning process. A major problem of concern to health occupations educators is how to determine the most effective methods for presenting information to a heterogeneous group of learners. The importance of clinical or cooperative education is evident in the health education process. The most effective method for managing such learning experiences is clearly less evident; it requires a very high level of skill. It is known that clinical experiences are effective when cooperative planning has occurred between the educational institution and the agency providing for the clinical experience. Such coordination is possible only when reasonably detailed affiliation agreements have been executed by the appropriate parties representing both institution and the clinical affiliate.

THE LEARNING PROCESS

Competency-based education is a process which influences learning effectiveness. Strange (1977) developed a curriculum based on expected competencies rather than on the amount of time spent by students in the educational setting. The report recommended research related to the restrictions imposed by administrative practices and techniques and indicated the need for additional time in program planning.

Vittetoe and Hooker (1978) surveyed the principles of performance-based teacher education and humanistic education. Both were determined as being necessary for preparing health occupations teachers. The Health Occupations Teacher Education Program of the University of Illinois provided an example of a blend of the two approaches. Instructional problems basic to each were examined. Observations were made that reliance on a

single-minded philosophy inevitably will create problems in developing fully competent teachers. The value of performance-based objectives as a means for instructing students also was discussed by Hill (1973) and Clark and Youse (1974). Their approach allowed for individuality to encourage and reward the students' initiative.

Dobbert (1975) described a competency-based curriculum in the College of Pharmacy at the University of Minnesota. The components included competency identification, validation and evaluation, instructional development, assessment of program operation, and maintenance. Each component was directed toward the overall goals of the program and was viewed as an essential activity for effective preparation. Keuhnelian and Kerns (1974) studied the change in philosophy toward pharmacology instruction for paramedical students. The approach required the use of nontraditional methods of instruction, that is, offering individual units which the students completed at their own rates, utilizing their different learning styles. The findings indicated a change in attitude and achievement as measured by grades. Laughlin (1977) discussed a similar project aimed at redesigning chemistry courses for an individualized system using computer-assisted testing. Having mastered the material, the students used computer testing which allowed for flexible timing in completing the course requirements.

Effectiveness of the learning process requires that the instructor be a facilitator of the acquisition of information rather than the sole provider of information. Miller and Fulop (1974) discussed this strategy, along with others, in a number of papers which they edited. Although the papers were concerned with medical education, the concepts had application for allied health education. Freeman et al. (1975) described a program effort which resulted in changing the role of the instructor from a dispenser of information to a manager of the environment in which the students were active in the learning process. Extensive use was made of individualized learning packages, small-group activities, flexible classroom space, and a wide variety of audiovisual aids.

Student involvement also is a vital part of the process. Chaney et al. (1974) described a procedure in which students were allowed the freedom to discover underlying principles by determining their own sequence and method for learning. Two computer-assisted instructional formats were used to improve the quality of physics instruction within a radiologic technician program. Tbe program, however, apparently was more effective when new concepts were presented to students with average or below-average ability. Abraham and Ponder (1975) also concluded that teaching methods involving student-teacher interaction

produced superior achievement when compared with the lecture method. Since the study dealt with the cognitive area, the results might not be the same for psychomotor tasks.

UNIQUE LEARNERS

Morgan (1974) reported a conference dealing with the learning styles of allied health students. The papers stressed various aspects of cognitive and affective dimensions of learning. Ritchie (1975), in a study on the relationship between personality type and preferred learning style, indicated that certain methodologies were most productive for each personality type. The report of the study recommended that programs be structured to accommodate not only various learning styles but also various personality styles.

Regler and French (1975) developed the Learning Preference Inventory to measure the affinity for different modes of learning. The following six dimensions were included: abstract, concrete, individual, interpersonal, student-structured, and teacher-structured. The study also used the Myers-Briggs Type Indicator to identify students according to sixteen different personality types. The mean scores for concrete and teacher-structured scales were generally higher for all groups than for the remainder of the scales. This might be due to the fact that students were more accustomed to this type of approach as a result of their previous educational experiences. The study recommended research to determine whether a shift toward more independence in learning styles at the conclusion of the program was obvious.

According to Stein (1971), uniqueness of the adult learner suggests that adult educators do not "teach" but "evoke" learning responses. This requires that the instructor be capable of arranging opportunities for learning most suitable to the learners' needs as individuals.

Minority or disadvantaged learners appear to have three special needs: financial, educational, and psychological (Blewett 1974). They usually require more financial aid, higher levels of academic reinforcement, and recognition of cultural differences which can cause isolation from other students. The report suggested this problem must be given attention throughout the entire process and not solely at the time of recruitment or admission.

Whittington and Benson (1975) described the barriers which prevent application, matriculation, and completion of allied health postsecondary education programs by blacks, Spanish

surnamed Americans, and Native Americans. The findings indicated that most of the minority students did not include allied health in their career selection because of the absence of or insufficient knowledge of available opportunities. The students entering postsecondary programs found the academic requirements difficult, sensed a feeling of social isolation, and seemed unable to obtain supportive services needed in dealing with the environment.

Martinez (1978) studied the efforts to recruit minority students to the University of Utah. The majority of the colleges did not have minority recruitment or retention programs. However, the university did provide special programs for minorities, including the Health Science Summer Program, the University Tutoring Service, and the Center for Ethnic Student Affairs. Sands (1971) reported how vocational education programs have helped meet the needs of the disadvantaged students while at the same time met community needs for better health care services. Programs were designed to help disadvantaged students to be both health workers and more effective consumers. The report presented several examples of successful graduates of such programs.

The Health Careers Information System is an organization designed to identify lower-income and/or minority college students who have an interest in health careers. Their report by Gunn (1975) indicated the organization was designed to help overcome some basic problems of disadvantaged students, which were identified as follows: insufficient funds for financing education; the need for peer-identity and effective role models; lack of academic preparation instead of academic ability; recruiting directed around a minority focus; and more intensive counseling services. Muzio et al. (1974) described a two-course sequence on human anatomy and physiology using the audio-tutorial method in the health or medical fields. This approach was found to be ideal for fostering individualized learning for students having academic difficulty. Rosenbrier (1974) reported a one-year pilot career program in biomedical equipment technology for handicapped community college students who were successful when architectural barriers were removed. Innovations introduced to assist handicapped students were found to benefit all college students.

Foreign trained nurses represent another unique grcup which requires special attention. Fischer (1973) described a program designed to assist such students in English so that they might succeed on the state board examinations. The program included seventy-two hours of instruction over a seven week period, using adult basic education materials with medical contexts and a nursing review source.

SPECIFIC STRATEGIES

Role-Playing and Simulation

Studies by Carpenter and Kroth (1976); Payton et al. (1975); and Schnell (1976) investigated the use of role-playing to assist students in improving therapeutic communication skills. When students used role-playing, they were more effective in therapeutic communications than those who apparently had not used this technique. Simulation was used to increase understanding of sensory deprivation and institutionalism experienced by the elderly (Wasmuth, 1975) and to assist nursing students in facing feelings related to death (Mills, 1977).

Case-Method and Problem-Solving

Swatsley (1964) studied the effectiveness of the case-method in teaching interpersonal relationship skills to psychiatric aides. The investigator, who used the case-method approach with one group and lecture-discussion with another, concluded that the former was slightly more effective. The case-method also was useful in assisting students to learn how to confront the problems of different patients (Price, 1970). The method, as designed, created a physical laboratory for experimentation where failure can occur without threat to learners or risks to patients. Lastly, case studies have been used to encourage the team approach in providing health care. Karni et al. (1976) and Roush (1973) examined the approach in allowing each health care discipline to discuss their role for a particular situation as well as to be more aware of the roles of other disciplines involved in providing health care services.

Clinical and Cooperative Rducation

Morgan et al. (1976) developed an annotated bibliography on clinical education for the health professions which covered the components of site selection, student placement, facilities and curriculum, evaluation, and financing. Morgan and Perry (1976) also provided similar information for staff development in physical therapy clinical education. The report recommended research to determine the factors influential in first employment situations for new graduates. Lind (1970) indicated the need exists for more research in predictive measures to test the students' ability for training in clinical sites in the field of occupational therapy.

Improvement in clinical education has been a major concern of the allied health field for many years. Development and extensive utilization of self-instructional materials have the potential to support such improvement (Holcomb and Milligan, 1974).

The School of Medical Services, the University of the Pacific (1975) described clinical units by listing the major characteristics of each; a sample affiliation agreement with clinical facilities for the educational experiences for students also was presented. Kintgen (1976) presented information for instructors and administrators in surveying agencies regarding the appropriateness of these facilities for clinical rotation sites for health occupations programs. Finally, at the secondary school level of health occupations education, cooperative education is utilized often. For example, the University of Georgia (1975) designed a guide for cooperative education teacher-coordinators who were planning experiences for high school students who expressed an interest in health careers.

CONTINUING TEACHER EDUCATION

INTRODUCTION

The standard approach to teacher education - preservice followed by inservice - does not always appear to apply in health occupations education. For some programs, certification is not required and degree requirements are not explicit for employment conditions. The old adage was accepted by some that if you were a good practitioner, you also could teach. However, with emphasis on performance-based teacher education and competency-based vocational education, the need for teaching competencies (and teacher education) was focused more sharply in the last ten years.

In the teaching-learning process in health occupations education, several important issues have arisen. For example, teachers in health occupations are members of two professions, teachers and practitioners in health care delivery. As such, they must engage in professional development activities related to their practitioner role as well as to various teaching roles. The question of mandatory versus voluntary continuing education also is an important issue. The system for granting credit and awarding recognition was identified for some professions. Other issues such as the factors influencing participation and studies related to job-time vs. leisure-time participation surfaced. Lastly, the cost and other factors related to licensure/relicensure and standards of professional practice of inactive practitioners also are significant issues for employers.

DEFINITIONS

In 1963, the Surgeon General's Consultant Group on Nursing recommended that a separate investigation determine what responsibilities and skills were needed by nurses to provide quality patient care. In 1968, a National Commission for the Study of Nursing became operational. Lysaught (1970) reported recommendations of the commission. One of the most important concerns which emerged from the extensive examination of the nursing profession related to continuing education. The key concepts were defined as follows:

- Advanced Education - sequences of professional courses aimed at developing specialized qualifications and characterized formalized academic recognition of completion, such as the awarding of a master's or doctoral degree.

- Continuing Education - a formalized learning experience or sequence designed to enlarge the knowledge or skills of practitioners who have completed preparatory sequences.

- Inservice Education - a program administered by the employer that is designed to upgrade the knowledge or skills of the agency's own employees. (p. 6)

Syracuse University (1973) defined continuing education as a systematic effort to develop the abilities, skills, knowledge, and attitudes of persons engaged in providing health care so that they perform their functions.

On February 10, 1971, a landmark statement from California - Assembly Bill No. 449 - was reported (Landmark, 1971). This legislation established the Council on Continuing Education for the Health Occupations. The council's duties were to establish standards for continuing education which would assure currency of knowledge as a basis for safe practice; to provide a variety of alternatives for licensees to comply with the continuing education requirements for renewal of licenses; and to organize committees to formulate proposed standards in each occupational field. In addition, the legislation provided that the renewals of licenses would be granted under the following conditions:

- That the holder submit proof satisfactory to the board, that during the preceding two-year period,. . . has informed himself of developments in the field.

- That the board shall accept as evidence of current knowledge . . . the successful completion of a course or courses of continuing education . . . which have been approved for this purpose. (pp. 29-30)

The American Nurses Association (1972) endorsed the concept of continuing education for all registered nurses as one of the means by which nurses can maintain competence and meet the standards of practice developed by the profession.

THE NEED FOR CONTINUING EDUCATION

Tomlinson et al. (1971), in a longitudinal study, disclosed that a large number of applicants were in need of refresher and remedial educational services. Nakamoto and Verner (1973) reviewed the literature on continuing education for the 1960s. They covered literature on medicine, dentistry, nursing, and pharmacy.

The Public Health Service (1971) published a directory of continuing education activities available to laboratory technologists and personnel. Among other things, it included courses offered at various colleges and universities and professional organizations offering continuing education activities.

Syracuse University (1973b) compiled a list of terms related to continuing education to serve practitioners in health professions. In addition, Syracuse University (1973a) published an annotated bibliography to aid decision making on continuing education for personnel in health occupations.

State Needs Assessments

Rural Michigan was the site of continuing education efforts (Beebe and Eirite, 1976). Data were obtained from a survey of 150 nurses who identified priority subject areas and resource persons. A series of workshops was conducted in a rural area where travel distances and lack of financial support from health care agencies were barriers to continuing education.

Huthin and Holmberg (1974) conducted a study to determine the extent of existing inservice education programs available in northeast and central Nebraska and to assess the need for a community health education consortium (CHEC). The researchers concluded that there was a substantial need for a CHEC that would organize and strengthen available educational offerings. Although hospital and nursing home expansion was projected to be minimal in the future, licensing requirements, retirements, promotions, and turnover were anticipated to result in a continuing demand for relevant educational programming in the health care area.

Following the recommendation of the National Conference on Continuing Education for Nurses, the state of Ohio implemented a coordination effort for continuing education. Kruse (1971) described a nursing coordinating council for Ohio which met to establish ground rules to coordinate the activities of various organizations and educational institutions concerned with continuing education for nurses. The purpose was to provide all nurses with opportunities to increase their knowledge and skills for the delivery of health care.

Regional Efforts

An investigation of the roles of selected voluntary health agencies in continuing education for health personnel was reported by Duffer (1977). The investigation sought to determine

the agencies' participation in continuing education, their structure, and philosophy. The study noted the agencies' increased future involvement with health organizations in continued health education efforts.

Cope (1976) described the shared services and joint planning of the area-wide continuing education program of the Northwest Allegheny Hospitals Corporation, a consortium of seven acute care and two rehabilitation centers in Allegheny County, Pennsylvania.

Under the Comprehensive Health Manpower Act of 1971, Area Health Education Centers were developed. The program of regional planning efforts for continuing education in North Carolina was reported by Knoewing et al. (1976). The major planning problems highlighted were aggregate numbers, continuing education suppliers, geographic distribution, and budgets. Cooper (1972) reported the results of a national conference in which papers were presented on such topics as philosophies of education with implications for continuing education in nursing, developing a model for consumer health education, and competencies expected of the teacher in continuing nursing education.

THE ROLE OF PROFESSIONAL AND OTHER ORGANIZATIONS

Nursing

The first national conference on continuing education for nurses (Gwaltney, 1970) provided an opportunity for the 109 participants to share experiences relating to continuing education of nurses. Among the components they examined were the following: admininistration and organizational structures, staffing patterns, securing qualified faculty, financing, identification of characteristics of adult learners, establishing program priorities, the use of multimedia in learning, and evaluation techniques. Recommendations were - that university schools of nursing should support "hard money" positions for directors of continuing education; that continuing education and inservice education should collaborate in program planning and the differences between the two should be defined; and that future programs should focus on the characteristics of adult learners and the opportunities for continuing education throughout the life span.

The American Nurses' Association (1974) published "Standards for Continuing Education in Nursing" which stated that the quality of health care depended to a large degree on the knowledge, skills, and attitudes of practicing nurses and that continuing education was one way nurses could maintain competence. The statement also pointed out that providers of continuing education programs might

collaborate with other health professionals, nursing personnel, community agencies, and consumers of health care services in the development of continuing education offerings. It further pointed out that the American Nurses' Association, the individual nurse, the faculty, and employers all have responsibility for continuing education. In addition, the statement enumerated standards regarding the program, resources, and evaluation of nursing continuing education. It recognized the continuing education unit (CEU) as a means for recognizing participation in nonacademic credit educational offerings on a systematic basis. Lastly, it stated that the CEU should be used in that context only in a nursing continuing education recognition program.

Medical Technology

The American Society for Medical Technology (1973) presented the Professional Acknowledgement for Continuing Education (PACE) program. The individual education unit (IEU) was offered in recognition of one hour of participation in a continuing education learning experience that may not qualify for use of the continuing education unit (CEU) which required ten hours of participation. Seven articles answered questions regarding the continuing education unit and were valuable as documentation of the relevance and application of the CEU for professional continuing education.

To provide a central, permanent file of continuing education credits for persons in the field of medical technology, the American Society for Medical Technology (1974) through the establishent of PACE, made provision for recording three different types of units: college/university credits, continuing education units (CEU), and individual education units (IEU). General information forms included an explanation of the organization, purpose, and procedures of the programs; an information sheet for program participants; a sample program approval request form for continuing education programs seeking to grant CEU; and application guidelines and instructions.

This voluntary program to record and accredit continuing education activities by medical technologists was described by Zabezensky (1976). Established as a result of a task force on continued competency in 1973, PACE had the following purposes: to evaluate activities, to recognize participants, and to maintain a recording service of activities. The program became operational in January, 1974.

Professional Association Efforts

A voluntary Continuing Education Recognition Program (CERP), implemented by the Illinois Nurses' Association and described by Shine and Frerichs (1976), was a four-part program directed by

the association's Council on Continuing Education. It provided for a system for review and recognition for continuing education offerings within the state; an official continuing record of each individual's participation in continuing education activities; a recognition process for awarding credit for academic courses; and a petition process concerning validation of participation in activities which had not received prior approval by CERP. The Association reported reviewing forty programs every two weeks. A seven member committee was charged with the responsibility of defining criteria for program approval. The review process consisted of a check by an administrative assistant to determine whether the data and the sponsoring agency were acceptable; a pre-review which determined whether all of the required documentation was present; and a panel review which determined the quality of programs in terms of awarding credit.

McKenzie and Puertz (1976) described the Indiana Statewide Plan for Continuing Education in Nursing (ISPCEN). The program was implemented to establish a structure for coordinated resources, data, and personnel which would provide quality continuing education for registered and licensed practical nurses in Indiana. The plan was designed to provide opportunities for nurses to maintain competence, meet the changing standards of practice developed by the profession, exercise leadership effecting changes in health delivery services, and achieve career satisfaction. A formative evaluation procedure was designed around two questions: To what extent had ISPCEN made an impact on the active nurses in Indiana? and To what extent had ISPCEN accomplished its goals? The planning of and carrying out of activities that contributed to continuing education of nurses by the American Heart Association also was described by Lembright (1970).

ATTITUDES OF PRACTITIONERS TOWARD CONTINUING EDUCATION

Several researchers looked at the issue of voluntary versus mandatory continued education and the factors influencing participation. Sweezy et al. (1974) reviewed the feasibility of implementing a national voluntary system of certification of allied health personnel. The investigation addressed the soundness of the concept, the readiness of the various professional groups to accept it, the functions and responsibilities which could be assigned to such a system, and the expected development costs. Methods included in-depth interviews with key individuals in professional associations and registry groups and others with potential interest. Data focused on organizational factors and certification practices to clarify the potential values and problems of a national system,

definition of alternative approaches, and feedback from seminars. The major conclusion was that a national system based on voluntary collaboration of certifying bodies was feasible; that four acceptable alternatives existed among the various courses open to the Department of Health, Education, and Welfare; and that governmental support of an interim secretariat was suggested in order to implement the recommendations.

Bush and Lewis (1978) explored the subject of mandatory continuing education. They surveyed 113 registered nurses working in three hospitals in order to ascertain how nurses felt about continuing education and to examine the interactions between attitudes toward continuing education and personal/professional circumstances. The results provided strong evidence to support a voluntary rather than a mandatory approach. However, Larocco and Polit (1978) previously reported a study with opposite interpretations. They surveyed 229 nurses to determine attitudes toward mandatory continuing education for relicensure. Based on 115 responses, the findings indicated that the majority were supportive of the mandatory approach. Nurses who had membership in the American Nurses Association were more likely to favor mandatory continuing education than were nonmembers.

The question of requiring continuing education also was studied by Covine (1977). The views of 989 allied health professionals were analyzed. A significant majority expressed the belief that continuing education was necessary but should be voluntary. The expressed preferences were not related to the professionals' specialty fields or demographic, educational, or employment characteristics.

Curran (1977) investigated factors affecting participation in continuing education. A questionnaire was administered to 800 registered nurses. Data indicated significant differences in identified learning needs and participation in continuing education according to such characteristics as age, income, nursing program, and employment position. Miller and Rea (1977) also conducted a study involving the distribution of a questionnaire to thirty nurses to determine the extent of their participation in voluntary continuing education, and their attitudes toward mandatory continuing education.

Participation in PACE (Professional Acknowledgement for Continuing Education) by medical technologists was discussed by Zabezensky (1976). During the first year of the program, 25 percent of the membership participated. Individuals who obtained four semester hours of academic credit or six CEU credits or a combination of both (plus thirty hours of Individual Education Units) were awarded special certificates.

Kubat (1975) reported on the demographic characteristics and motivational patterns contributing to obsolescence. Responses from sixty-five registered nurses revealed a lack of continuing education and of intrinsic motivation to remain competent.

The following year, Kubat (1976) reported on a second study on the correlates of professional obsolescence. The target population was nurses who were older, employed less than full-time, and lived in small communities.

Lynch (1977) measured the effectiveness of change, knowledge, attitudes, and skills in continuing education. Fifty-one registered nurses were administered a pretest consisting of fifty items; the same examination served as a posttest two years later. When the results of both tests were compared, the researchers concluded that the behavior of a significant number of nurses was changed in the three areas: knowledge, attitudes, and skills. Although the behavioral changes were the greatest in the skills and knowledge domain, it was encouraging to find that there were forty-four changes in responses in the attitudinal area (p. 10).

Bevis (1975) explored the relationship between three components of role conceptions (bureaucratic, professional, and service) held by nurses at the end of the first year of graduate practice. Six hypotheses were studied, four pertained to the extent of educational participation and two to its nature. The major conclusions were as follows: the primary influence on participation in continuing learning activities was the service component of role conception; complementary influences on participation were the professional and service components; and conflict between the bureaucratic and service components exerted a negative influence on participation in the absence of a high professional component. The main implications were that programs in nursing education should continue efforts toward professionalization of the occupation; should intensify service orientation to nursing; and, in nursing service administration, should emphasize patient-centered nursing and de-emphasize bureaucratic orientation.

Burgess (1976) studied the level and relationship of self-esteem and career aspirations among a total sample of 503 nurse participants of continuing education. Skipper and King (1974) reported an evaluation study which focused on attitudes about continuing education. Data were collected from a sample of 175 practicing nurses.

ORIENTATION TO PRACTICE

The need for orientation programs for beginning practitioners was stressed early in the 1970s. Walton (1970) stated that

limitations in educational programs cannot be manipulated to provide for change in society's expectations for practitioners and observed that a meaningful work experience following basic preparation would strengthen and nurture abilities - "with every avenue of development explored and made available" (p. 13).

Lysaught (1970) stated that "the obvious input differences to two-, three-, and four-year preparatory graduates into the same health care system is argument in itself for differences in initial behaviors and the need for continued provision of learning experiences that will make up for any gaps in preparation" (p. 6).

Ellis (1971) in describing inservice education in a clinical research hospital, stated that orientation, training, and inservice activities were designed to provide assurance that nursing care standards would be met. These activities were designed to familiarize the staff with the demand for repetition and precision and the ways in which nursing personnel provided support to the physician.

Moore (1970) expressed the view that the staff development unit and the nursing unit must work together and that while the nursing unit should determine the need for education and its content, the staff development unit should provide effective educational methods.

Four basic considerations of curriculum development for nursing orientation programs were reviewed by Copeland and Miller (1976): goals, learning objectives, learning experiences, and evaluation. Crockett (1978) described how to improve an existing orientation program for nurses and how to implement a new one by utilizing management by objectives. To ascertain the specific determinants that should be considered when instituting continuing nursing education programs, Edelstein and Bunnell (1978) conducted a survey of nurses. The seven determinants identified included the need to do prestigious work, interest in increasing one's knowledge base, and special needs related to the employing institution. Trussell and Crow (1977) emphasized the need for continuing education programs for nurses in hospitals to orient newly employed graduates to infection control measures and to reinforce those learnings by regular, planned programs.

Sturges and Ouina (1971) developed four pen-and-pencil tests for assessing the effectiveness of inservice training provided for either home health or nurses' aides. The tests consisted of multiple choice and matching items. Data were obtained from nurses' aides who were employed to provide personal and rehabilitative care under supervision to geriatric patients in the patient's home. Moderate success was reported in developing

instruments which could be useful in selecting nurses' aides for employment, in selecting aides for assignment to patients requiring different degrees of care, and in assessing the effectiveness of inservice training in basic elements of nursing care.

Porter et al. (1973) studied organizational commitment and job satisfaction as they related to turnover. Their sample consisted of recently employed psychiatric technician trainees. Attitude measures were collected over a ten and one-half month period. The researchers found that job satisfaction measures were better able to differentiate future "stayers" from "leavers" in the earliest phase of the study. With the passage of time, organizational commitment measures were a better predictor of turnover. Job satisfaction failed to predict turnover in the later time periods.

Kase and Swenson (1976) explored the costs of hospital-sponsored orientation and inservice education programs for registered nurses. They conducted a nationwide survey to analyze hospital and inservice education programs to determine their nature and costs with their focus on the differences in orientation costs for new nurses with three different types of preparation (diploma, associate degree, and baccalaureate degree). They also investigated cost differences in hospitals of varying sizes. Information was obtained through a questionnaire to a sample of short term, nonfederal general hospitals. Retrospective data were supplied by a stratified random sample of 394 hospitals (a total of 998 nonfederal acute care hospitals received questionnaires) in order to make projections to the designated population of 5,865 hospitals. The total national cost of inhospital education was estimated to be $226 million (60 percent for orientation and 40 percent for inservice education). Average total costs per sample were figured as well as costs per new nurse for orientation and inservice education. Only direct salary components of the costs were computed, both for training staff and for recipients of the training. Associate degree graduates generally averaged more hours of clinical unit orientation than either diploma or baccalaureate graduates. Average salary costs for the training staff for both orientation and inservice ranged from $7,176 in the smaller hospitals to $80,062 in the largest.

SPECIAL SKILLS

Norman and Hoffman (1976) discussed the restructuring of an inservice education class (on intermittent positive pressure breathing) in order to provide more practical skill experiences and problem solving situations. Results of performance tests

using a computer monitored patient simulation indicated that previously used cognitive tests and subjective evaluations were not adequate for determining course effectiveness.

Mayne (n.d.) developed a guide for an inservice program for nursing personnel who cared for the chronically ill and aged in extended care facilities. Provisions were made for responsibility for inservice education; objectives, planning, initiation, and development of the course; a comparison of instructional methods; and program evaluation.

Reed (1973) presented another focus for an inservice program for all levels of nursing home personnel. The program consisted of four sessions scheduled one week apart. Each session included time for participants to practice and discuss the skills of attending, responding, planning, and assessing. All of these skills were important in effectively helping residents in nursing homes. Pre and posttests were used to measure changes in levels of functioning. The findings included an improvement in attitudes toward participants' jobs and an increased level of knowledge of the biological and psychological changes that occur in the aging process.

PROFESSIONAL AND PERSONAL DEVELOPMENT

The basic philosophy of a continuing education program described by Lysaught (1970) included the following tenets: It should be of equal importance with preparatory and advanced education. It should provide for congruent roles in health care. It should be the vehicle that can either foster or inhibit the developmental process toward professional growth. It should be dependent on each individual making nursing an unambiguous profession by taking personal responsibility for professional growth and development.

McNeil (1970) viewed continuing education as an effective means of assisting planned change within hospitals and other health care agencies and institutions. Learning was viewed as a lifelong process to assure effective professional practice.

Tobain et al. (1974) examined the development, process, and concepts of staff development in nursing education and its relationship to continuing education. One important differentiation made was the use of the term "staff development" for "inservice education."

The concept of life-long learning was the focus of several research studies. Knox (1973) discussed the approach of lifelong, self-directed continuing education for professionals in the health sciences. The four main emphases were on: continuing professional education; model or mentor roles; the self-directed learner in action; and guidelines for facilitation of self-directed education. The report included objectives relating to the following: understanding the functioning of the mentor role as it is used to guide self-directed education of health professionals; understanding a variety of effective strategies by which professionals can alternate between action problems and knowledge resources; recognizing the way in which self-directed education fits into the broader context of continuing professional education; recognizing that self-directedness in learning is a continuum which can be used by professionals to discover ways in which learning effectiveness can be proved; and appreciating the ways in which the proposed approach to lifelong, self-directed education can be useful.

Stein (1971) described observations on what motivated adult learners. He stated that he saw adult learners acting out their roles as adults, strengthening their relationships with society, and fortifying their leadership potential. Stein felt that the linkages between continuous education and leadership could be strengthened by individualized curricula. Moore (1972) described the principles of learning and retention as a base for performance training in a life threatening situation (where cardiopulmonary resuscitation was needed). As was pointed out by Lysaught (1970), continuing education was defined as "a formalized learning experience or sequence designed to enlarge the knowledge or skills of practitioners who have completed preparatory sequences" (p. 6).

Walton (1970) observed that "keeping individuals in the career requires the combined efforts of the employing agency, the practitioner, and the institution offering continuing education programs for nursing. . . . In fact, the basic program provides a decreasing percentage of the total sum of nursing knowledge necessary for practice." Walton stressed the need for professional development programs which utilize the worker's potential and which offer alternatives for increasing development which the individual perceives as useful for achieving career goals. To carry out such a program the following must be present in the agency: a commitment to education and willingness to change; facilities, human resources, and money in order to have an effective program; administrative support; and a thorough analysis of needs. Walton suggested seven dimensions of a program, those concerned with the orientation program, on-the-job training, institutes, conferences and conventions, the use of special resources and consultants, extension classes, and the use of committees to solve immediate problems.

Edelstein and Bunnell (1978) conducted a study to ascertain the determinants of continuing education. Based on 425 responses to a survey of nurses, seven determinants were identified, including the need to do prestigious work, interest in increasing one's knowledge base, and special needs related to the employing institution.

Spikes (1978), in describing a multi-dimensional program planning model for continuing nursing education, stressed that educators should move from a unidimensional focus which examines only the internal determinants of the nursing profession to a holistic focus embracing a community orientation. The model presented was comprised of five elements for use in planning continuing nursing education programs. Del Bueno (1976) discussed an inservice learning format which required both a standard for performance and a tool to measure performance objectively. The researcher reported that the use of this format could change the nursing inservice education emphasis from transmission and acquisition of knowledge to acquisition and application of skills and knowledge.

Recognizing the need for continuing education for medical laboratory workers, the National Committee for Careers in Medical Laboratory (1974) put together seventy-two self-study lectures to help workers keep up with developments in their fields. Six hundred slides and printed texts accompanied the study.

Romeo and Johnson (1977) designed continuing education activities to upgrade the skills of laboratory personnel. They described short courses, refresher courses, and self-instructional materials.

Saint Joseph Hospital (1976) designed a project to implement a system for the development of health care team members in emergency and coronary care. Programs, curricula, and evaluation methodology were devised for four levels of critical care personnel: registered nurses in emergency areas, coronary care personnel, emergency medical technicians, and medic emergency medical technicians.

Bechtel et al. (1975) developed six curriculum outlines adaptable for the personnel development needs of both rural community hospitals as well as large metropolitan hospitals. The guides included a discussion of principles of learning, behavioral objectives, and an outline of content.

Haferkorn (1975) designed an on-going program to meet the educational needs of coronary care nurses in the Seattle area. In addition, Darner (1975) developed a comprehensive continuing education program in trauma nursing. Designed to be a prototype for the state, the latter project included implementation plans

for three Florida counties. The objectives were to develop a central management unit that would direct and evaluate the project activities, develop a modular curriculum on trauma nursing, implement activities for a minimum of three programs in the three counties, develop testing and evaluation tools, and conduct an on-going evaluation.

Wise (1974) indicated that the integration of a psychiatric liaison nursing service with a traditional psychiatric consultation service presented the students and house officers a unique opportunity to learn the tasks facing a nurse on a general hospital ward.

Specific medical and surgical conditions or their treatment received the attention of some researchers. Baldwin and Tucker (1976) developed a multimedia educational system to teach professional nurses the knowledge and skills necessary to manage the hypertensive individual. Due to the varied backgrounds among nurses, the program was designed to provide alternate routes through the learning system.

Pounds and Littlefield (1976) designed an assessment to identify education needs of operating room nurses. The study identified the following factors: technical operating room skills, nursing research and evaluation, direct patient care, and personal management skills. It also examined the learning needs of operating room nurses with different levels of formal education, nursing experience, and staff positions.

Continuing education for health service professionals operating nursing homes was the subject of a report by Mowrer (1972). The data focused on methodologies and techniques employed in Missouri and other states and on participation by colleges in the organization and management of training programs. Hamiester (1977) designed a study to identify the specific needs of nurses' aides as identified by administrators and charge nurses and to determine the appropriateness for inclusion in a training program. Monaco (1976) discussed planning and implementation of a continuing education program for nursing staff in out-patient clinics. Interviews were used to assess needs; seminar sessions held two times each month stressed participant involvement. Igoe (1975) described a four-month intensive course in primary health care for experienced nurses serving in disadvantated areas. It was followed by inservice training with regular consultation from local physicians. The course extended the traditional role of school nurses to include comprehensive evaluations, management of minor illnesses, and students' health education.

Payton (1975) investigated the effect that teaching of empathic communication skills in a graduate course in supervision would have on the empathic skills of allied health workers. Data

indicated that, at the end of the course, the students were more capable of identifying empathic statements than they were at the beginning. Marshall et al. (1971) studied the empathic skills of psychiatric aides in order to determine if a short training program focusing on interpersonal relationships, communication and observation skills, and knowledge and understanding of behavior would increase the empathic ability. Using random selection, black aides of low socioeconomic backgrounds were assigned to either an experimental or a control group. The experimental group attended twelve training sessions held twice a week for six weeks. The sessions focused on awareness of one's feelings and those of emotionally disturbed children, and the ability to empathize with those children. According to the researchers, positive change in empathic abilities in the experimental group was evident.

Although the utilization of foreign nurses was an issue during the 1970s, few reports were documented. However, programs targeted for inactive registered nurses were reported. Designed to help the inactive registered nurse, a refresher course was designed by the Health Resources Administration (1974). The course used a self-instructional, individualized learning process that could be applicable to as few as one or two students. The curriculum consisted of sixteen basic instructional modules organized into three groups: part one consisted of modules on nursing role and patient care; part two included information about the instructor role, student characteristics, and preliminary module descriptions; and part three consisted of the syllabus of module objectives, classroom, laboratory, and learning experiences, and proficiency experiences.

Belock (1977) developed a practicum dealing with the preparation of inactive registered nurses for re-entry into practice. The first three modules of the course were focused on the nursing process, the endocrine system, and the transport system. Effects of the course were projected through a follow-up study and evaluation of the nurses six months after employment.

PATIENT/CONSUMER EDUCATION

Consumer/patient education - with attention to the teaching/learning process, behavioral objectives, characteristics of learners and readiness for health education, teaching methods, aides, evaluation, and delivery systems - is being considered.

Simmons (1976) provided a report on a workshop conducted for fourteen health education practitioners and administrators. These representatives from a number of different hospital and health care settings were brought together to appraise the status

of patient education programs. The report documented the initiation and growth of patient education programs, through teaching guidelines for certain patients in need of instruction and design components for planning for patient education programs.

SPECIAL METHODS

Activities deemed to be innovative in continuing education for health occupations education personnel were reported by Syracuse University (1973). Adams (1971) developed self-contained study units which had been designed around a particular nursing problem, a specific illness, a broad content area in nursing, or a nursing technique. Fields (1976) described the opportunities for part-time study for nurses who were employed full-time and who were seeking advanced education. A major portion of the requirements for the baccalaureate degree could be met through independent study activities.

Spicer (1976) described instruction for health personnel by means of a mobile continuing education program. The article outlined the use by the nursing faculty of a van equipped with audiovisual aides and a lending library. Fry et al. (1976) explored the use of a telemedicine system consisting of live, color microwave television transmission. The program on critical care nursing originated in an urban university medical center. The provision of interaction using two-way auditory and visual communication capability was targeted as an instructional method for staff members in rural southeastern Ohio hospitals. Phensley and Palmer (1975) also used broadcast television in continuing education in nursing.

The Missouri Regional Medical Program (n.d.) reported the use of two-way telephone conferences developed to make continuing education available to health professionals in community hospitals. The conferences were implemented by the development of guidelines for contributing faculty and receiving institutions. These consisted of suggestions for moderators at the studio, general instructions for receiving institutions, and program procedures for receiving institutions. The target audience was physicians but the conferences were available for all health professionals. Carpenter and Kroth (1976) determined that videotape-recorded role playing appeared to be an effective technique for nurses attending continuing education classes in verbal and nonverbal therapeutic communication skills.

THE UNIVERSITY AND CONTINUING EDUCATION

The university's role in continuing education in nursing was described by McNeil (1970), who saw it as a leading resource for meeting expanding needs. However, the author observed that "we have an obligation to define what (university) degrees really mean in terms of knowledge, judgment, and skills" (p. 9). McNeil described two characteristics of traditional university programs which make them ill suited to the needs of adult learners: They are often offered at times and places which are inconvenient, and accessibility to libraries and opportunities for student-faculty interaction is difficult for adult students. McNeil also noted that continuing education must provide sufficient faculty and financial resources to meet program objectives and be supported by an administrative commitment comparable to that of teaching and research.

The need for university and college involvement in the thrust toward professionalism has been stressed. Thurston (1970) stated that continuing education must become an integral part of the educational system in order to provide nurses opportunities to keep up to date. Tait (1970) also described the roles of a department of nursing in contributing to community health. Lastly, Adams (1976) described a continuing education program at the University of Connecticut where the administration was independent of the university educational center.

Schecter (1974) described a nine-year project which established a communication network among universities, hospital associations, hospitals, and individual educators and trainees. The goal was the expansion of continuing education opportunities for personnel in health care institutions. The following themes were identified: a full-time education director could play a constructive role in both large and small hospitals; cooperative training programs among neighboring hospitals were desirable; state hospital associations should accept the challenge to take the lead in planning cooperative programming; and medical and educational centers should be assisted in taking professional leadership in such programming.

The Galveston Medical Branch of Texas University (1977) developed a Manual for the School of Allied Health Sciences which included procedures for faculty development (a performance and evaluation contract); forms for evaluating teaching effectiveness; administrative duties; professional activities; and a faculty development assessment instrument.

Robinson (1978) reported a study of personnel policies related to promotion and tenure in schools of allied health. Data were collected by a survey of allied health faculty in secondary and postsecondary institutions regarding tenure and promotion

variables. The report included distributions for institutions, faculty degrees, and tenured and nontenured faculty by rank and by field.

TEACHER COMPETENCIES AND TEACHER EDUCATION

Bailey and McNeil (1970) discussed short term teacher education institutes to evaluate the instruction of competencies needed by personnel in postsecondary health occupations programs.

Halloway and Bailey (1971), in response to the need to stimulate individuals and institutions to conduct short-term teacher education activities for persons in the health occupations field, reported on an institute held at Iowa University. The publication included guidelines, general presentations, and a model inservice teacher education course in classroom testing.

Three years later, a national conference on health occupations education was organized in response to a demand for dissemination of project findings and instructional materials in health occupations education. Reported by the Division of Vocational Education of UCLA (1974), the conference focused on the total instructional process. The resulting recommendations provided a basis on which guidelines for criteria relating to health occupations teacher education could be developed.

Another national conference on teacher education for allied health and nursing was held that same year. The proceedings were reported by the College of Education at the University of Georgia (1974). The primary concern of that conference was the identification of essential competencies for instruction in health care preparatory programs.

Franken (1975) developed a health occupations teacher education program at the University of Wisconsin. Her report included data providing support for the need for such a program, a discussion of national health care needs and trends, a description of existing health occupations teacher education programs in other colleges and universities, an estimate of the need for teachers of health occupations education at the secondary and postsecondary levels, and potential financing and recommendations.

Hill (1977) attempted to define program content and alternative delivery systems for a health occupations education program. The objectives were to identify appropriate competencies for teachers of health occupations programs; determine the need for instruction for each objective; identify delivery systems for teacher education compatible with teachers' needs and resources

available in the state of Washington; identify techniques to help eliminate sex stereotyping among health occupations teachers; and disseminate the information to interested persons.

A workshop for inservice education personnel in allied health was conducted by the Division of Technical Education (1971) of the Illinois State Board of Vocational Education. The purpose was to provide information, instruction, and assistance in developing behaviorally-oriented learning materials for use in classroom and laboratory situations. Workshop activities included analyzing selected health or health-related occupations, writing behavioral objectives, and modifying materials to behaviorally-oriented learning approaches. Participants expressed the need for further assistance in implementing course materials based on the performance approach.

Using Flanagan's critical incident technique to collect reports of observed behaviors which students perceived as being effective or ineffective for teacher performance, Arlton (1975) conducted a study to determine competencies needed for teachers of health occupations in secondary schools and vocational centers. Comments from students were solicited on behaviors related to instructional methods, classroom management, personal and career guidance, student evaluation, and coordination of plans with the health facility to obtain field experiences for students. Data were gathered from direct classroom experiences. The results showed the students were most concerned with and favorable to teachers' methods of instruction and that they were disturbed by improper classroom management.

Higley et al. (1976) prepared a manual for short-term faculty development programs. The guide was designed for allied health faculty in health care facilities and academic institutions. Content included a discussion of a philosophical framework for planning short-term development programs; a description of administrative procedures and details; identification of teacher competencies necessary for teaching in allied health programs; guidelines for coordinating and teaching in the development program, and a sequence of seven instructional modules. Miller (1976) also described a two-course graduate sequence consisting of theory and a practicum on teaching, designed to help students become effective teachers.

Teacher Centers

The development of a health occupations continuing education center at the Evansville School of Health Occupations was described in three reports: Latshaw (1975) reported that the objectives of the first year of the project were to assess the learning needs in selected health occupations at the vocational level and to develop guidelines for the establishment of a model

for a health occupations continuing education center based upon these needs. The learning needs of licensed practical nurses, nurses aides, and operating room technicians employed in hospitals or nursing homes were assessed through a questionnaire. The researcher reported that a learning center with a flexible approach to programming would be required to meet the diversity of learning needs. Guidelines also were developed for planning, implementing, and evaluating the center. Stevens (1976) described the development of program curriculum content and activities according to established guidelines and criteria for accrediting continuing education offerings. The second year focused on refinement of administrative guidelines and improved communications to and from teachers. A total of 201 students were enrolled in nine class offerings. Community acceptance was perceived as favorable. Participants, program instructors, and advisory committee members evaluated program effectiveness. An increased number of employers paid (or reimbursed) the tuition costs of participants. Stevens (1977) summarized the study and proposed that the project continue to be implemented.

Richardson (1975) described an attempt to provide on-site consultation and inservice activities for secondary health occupations instructors in Minnesota. The purpose was to assist teachers in the utilization of individualized instructional materials which had been developed for secondary exploratory health occupations programs. In addition to consultation visits, workshops were held throughout the state. The teachers' responses to this format for inservice activities were favorable.

EVALUATION

INTRODUCTION

Taft and Logan (1974) pointed out the needs for systematic evaluation in allied health education. These needs were related to evaluative data which would serve as a basis for decisions related to validation for funding (federal, state, or private), identification of student proficiencies and deficiencies, and accountability (effectiveness of the educational processes being used). The research reported in this section will be presented within this framework, that is, under the broad areas of formative and summative assessment. The research, in general, posed questions related to the following five issues:

1. The primary program objective in health occupations education is the preparation of clinically competent practitioners. Historically, summative assessments (licensure, certification, or registry exams) have served as documentation of clinical competence. The research posed questions about the relationships of summative evaluation to on-the-job performance.

2. Very little research was reported on the cost analysis of health occupations education as it relates to program design, efficiency, or effectiveness.

3. The value of practical and/or clinical experience in health occupations education has been illustrated. When change is introducted in program design, it often includes fewer clinical hours. A process of delineating, obtaining, and providing useful information to judge the alternatives in relation to the total program should accompany the decision to change.

4. Change in program efficiency such as shortened curriculum is not always accompanied by entry level assessments. The persons who must implement change are frequently not the decision-makers who make entry level assessments.

5. The process of delineating, obtaining, and providing useful information for accreditation and certification boards to judge programs against selected standards in health occupations education requires a systematic approach to evaluation. The components of entry level, formative, and summative assessments must be included. If teachers are to be accountable for any one of these, their participation in the other two must be taken into consideration.

FORMATIVE ASSESSMENTS

Program Efficiency

Bayer and Schoenfeldt (1970) reported on two studies which collected data in conjuntion with Project TALENT, a longitudinal study of high school students, which reported comparative data for female students in nursing. One of the studies compared the characteristics of first-year students in three-year nursing programs with those of students in college programs; the other contrasted the characteristics of recent graduates of three-year nursing programs with female graduates of baccalaureate programs in nursing.

In the first follow-up survey one year after their class graduated from high school, 706 females who were enrolled in a three-year nursing program and 382 who were majoring in nursing in a four-year college were identified. The two groups were compared on fifty-eight variables reflecting aptitude and achievement scores, temperament and interest scales, educational plans, socio-economic status, and family orientation. In another follow-up survey five years after their class had graduated from high school, 268 females who had attended a three-year nursing program, and 3,172 who had attended a senior college were identified. Practically all of the latter had received a degree by the time of the follow-up. The two groups were compared on thirty-eight variables from ten major domains (aptitude, interests, temperament, socio-economic background, ethnic-religious background, residence, family orientation variables, high school characteristics, educational plans, and family procreation variables). On a follow-up of 8,965 respondents, diploma nurses and nurses from baccalaureate programs were compared on thirty-eight variables. The largest differences were on the socio-economic variables, the high school variables, the college commitment items, and the family of procreation questions.

The conclusions to the surveys were as follows: (1) There were generally negligible differences in measured aptitude and achievement between those in three-year and those in four-year programs. (2) There were no significant differences between the two groups on personality measures (temperament). (3) With few exceptions, the two groups tended to be similar in interests. (4) Family orientation variables such as sibling status or family size were not crucial in differentiating the two groups. (5) Socioeconomic background and variables were among the primary differentiating variables of all those studied. (6) College plans and parental encouragement were the major variables which differentiated the two groups. The researchers suggested that those who currently completed the three-year nursing program

could perform on par with those who enter and complete a four-year college program. They also made a statement which seems particularly significant in view of the phasing-out of so many diploma programs in nursing during the decade; namely, that before a national policy is adopted to undertake a gradual elimination of diploma programs, the possible effects on student socioeconomic background, career goals, and educational orientation, and the implications of the significantly greater attrition rate among nurses in baccalaureate programs need to be assessed.

Hoffman (1975) surveyed twelve medical and other health sciences schools which had implemented a standard three-year curriculum.

The findings indicated the following: (1) Only one of the twelve schools was planning to revert to a standard four-year program. (2) Some were introducing more attractive four-year curriculum options. (3) Self-ratings of the success of the three-year curriculum by the schools were generally favorable. (4) Three- and four-year students were found to be comparable in cognitive knowledge and clinical skills, although comparisons at one school showed that the four-year class rated itself far superior to the three-year class in knowledge. (5) Faculties appeared to be somewhat dissatisfied with the three-year curriculum, although students appeared to be generally favorable toward it. Overcrowding and overwork were cited as problems. One reported advantage was that implementation of the three-year program provided the impetus for intensive preliminary review and reorganization.

Rausch (1974) compared graduates from two curricula in medical terminology in terms of clinical hours. The researcher concluded that students completing a curriculum in medical technology with a shortened clinical laboratory phase, plus structured courses in basic clinical science, performed as well as students completing a curriculum with a full year of clinical laboratory experience. The comparison variables were related to employment situations.

Two studies related to advanced placement of nursing students. In a study at the Kirkwood Community College (Kirkwood Community College, 1976), Loomis and Falke developed and implemented a procedure to place individuals working in or with previous experience in the health field at the appropriate level of an associate degree nursing program, so that they would graduate with eligibility to take the Iowa state board examination for registered nurses. The procedures included development of the mechanism, selection of the candidates, competency evaluation, planning courses of study, and placement of candidates in existing programs. Of the students placed, none left for academic reasons. The report included an outline of

advance placement procedures, results of the challenge exams, an evaluation form, the syllabus for the advance placement seminar, and clinical performance tests on evaluation, criteria, performance objectives, and specific tasks. Significantly, in relation to program evaluation, a chart of the estimated costs of advance placement was included.

Rogers' project (1976) involved advance placement of registered nurses at Salem State College. Because of its wide scope, we have dealt with it at some length. Faculty at the college felt that the registered nurses who enrolled in the basic baccalaureate program often developed a high degree of skill in interpersonal relations and use of the nursing process. The project attempted to develop a form of evaluation that would enable program enrollees to validate their skills in these areas and to permit the faculty to exempt them from sophomore and junior year nursing courses, expediting their progress through the program. Another dimension was that the evaluation method should require registered nurses to demonstrate the skills in practice as well as in application of knowledge and theory through paper and pencil tests. Entry level assessments included meeting admission requirements of the college, possession of a current nursing license, successful challenging of the basic science courses, and successful challenging of the junior year nursing courses (twenty-four credits). This included passing the National League for Nursing Achievement tests in medical-surgical and maternal and child health nursing at the fiftieth percentile or higher, a satisfactory clinical evaluation based on performance on a situation simulation test to measure interpersonal relations skills, and a reality situation to test the use of the nursing process. The project was concerned with these tools used to validate students' competencies.

Videotaped sequences one or two minutes in length and focusing on a variety of behaviors of a client and a nurse were developed. Information was provided to be used in making decisions. Each situation portrayed the client's verbal and nonverbal behavior, the nurses's initial response, and the client's response. Students completed a response sheet that asked such questions as, "what would you say?", and "what are the reasons for your decision?" The following descriptions of three levels of response were established by the faculty.

> Most Therapeutic - verbal and nonverbal responses that move the client and the nurse to a greater understanding of the problem, and which help the client to focus on the problem that the nurse sees. Principles should be relevant and particularly insightful.

Appropriate - verbal and nonverbal responses that maintain and encourage communication and allow the client to continue exploration. Principles should be relevant and supported by the available data.

Least Appropriate - verbal and nonverbal responses that cut off communication, deny the situation or avoid the problem presented. Principles are not relevant or not supported by the available data. (p. 447)

Examples of verbal activity, nonverbal activity, and rationale for each level of response were developed. A panel of experts representing pediatrics, medical-surgical, maternity, and psychiatric nursing reviewed each situation for appropriate content and responses. A complete film with four sequences took about an hour for each viewer to complete. The first tape was viewed by a pretest sample of six nurses; their responses fell within the guides developed. The passing criterion was that 75 percent of all responses must be at least on the appropriate level. The tape had been used with twenty-eight registered nurse students, all of whom were able to achieve the standard 75 percent, with some providing 85 to 90 percent of their responses at the most therapeutic level.

The test population was thirty-four registered nurses who were working in twenty-three agencies representing fourteen clinical areas. The methods included an on-site visit by the evaluator and oral and written presentations by those being evaluated. The oral presentation was designed for three objectives: to give the nurse the opportunity to talk about the way he or she carried out the task; to allow for discussions pertaining to difficulties or limitations perceived; and to orient the evaluator to the specific agency or clinical setting. The written presentation on the selected patient provided a frame of reference for the discussion. After several students had been evaluated, it was determined that they needed expanded quidelines in interpreting the standards. Hence, a form was developed which explained each step of the process. It also indicated the degree to which the nurse (student) carried out the steps independently. The nurse (student) had to perform independently or with minimal assistance on 75 percent of the items in order to be considered successful in the use of the nursing process. All of the nurses were able to complete the evaluation successfully. They demonstrated a wide range of clinical and theoretical ability.

The following conclusions were reported by Rogers: (1) Of the students evaluated, fifteen already had completed senior year nursing courses which built on the skills evaluated by the use of interpersonal relations and nursing process tools. (2)

Preliminary studies indicated that students who had been given high ratings in evaluations based on these tools were high performers during their senior year; students with middle ratings were average performers. (3) The descriptive profile of the student which resulted from the use of these tools indicated not only strengths but also areas for improvement. The tools which were developed, although presented in a simplistic one-page format, offered promise for measuring essential nursing skills objectively and accurately, focusing on nurse behaviors as well as nursing knowledge, measuring nursing judgment, and giving the nurse the opportunity to demonstrate clinical competence.

The Division of Vocational Education of the University of California at Los Angeles (1968), with the cooperation of the Bureau of Industrial Education in the California State Department of Education, studied program design in dental assisting education. Twenty-two dental assisting programs were surveyed. The total number of hours of instruction for two, three, and four semester programs were reported. Trends in dental assisting were noted and a model associate degree program based on survey data was proposed. The trends included increased emphasis on ethics, professional organization, grooming, terminology, radiology, orthodontic and emergency chairside procedures, laboratory procedures for orthodontic and emergency appliances, insurance procedures, dental office and dental school experience, as well as general education (such as English, typing, speech, and psychology); and decreased emphasis in time devoted to denture construction. The model associate degree program which was proposed as a result of the survey data included 32 semester credits and a total of 1,011 semester hours in dental assisting courses; 14 to 20 semester credits in related business, communication, natural science, and applied psychology courses; and 1 to 19 semester credits in general education.

Clinical and Didactic

Two studies which related to entry level assessments and to formative assessments in both clinical and didactic areas were conducted with secondary school students and reported in two phases. Phase I, a project of the Division of Vocational Education (1971) of the University of California at Los Angeles, was designed to give tenth graders a variety of experiences in a family of occupations in the health field. The purpose was to prepare students either for employment or for making a choice in higher education in allied health occupations. The population was 100 tenth-grade students (25 in each of four innercity high schools). The following significant findings were reported: a wide range of pupils had an opportunity to have experiences with health care tasks; field trips were ranked as a most interesting aspect of the project; varying degrees of positive interest in

twenty-two out of twenty-three methods of learning were reported; 80 percent of the participants were able to specify a health occupation in which they were interested; and lastly, the month-long hospital experience had the greatest influence on vocational choices. The principal investigator concluded that an allied health curriculum in the secondary schools can produce commendable educational results.

Fielstra and Rosenquist (1972) reported on Phase II of the project. They indicated that the most difficult problem was the high dropout rate in the target schools. Half of the students routinely dropped out in the tenth grade. Therefore, the decision was made to start at that grade level in an effort to retain students by stimulating their interest in health occupations. The key to this was the clinical experience, getting students into the hospitals during the first week of school. The experiences gradually included "real life" task performance in the hospital environment. Two incentives, academic credit and a stipend of $15 a week paid from project funds, were added. The findings indicated that most of the students had been placed in part-time jobs where their training continued and that each student could leave high school with salable skills qualifying them for at least entry level hospital employment or for college credit for work already accomplished.

SUMMATIVE EVALUATION

The primary program objective in allied health education is the preparation of clinically competent practitioners. Documentation of clinical competence is usually judged in the form of licensure, certification, or registry examinations. The research reported below relates primarily to employability skills, job performance, and perceptions of program completers about the adequacy or relevance of the educational program.

Three studies were reported which sought to determine the relationship between job performance and the licensure examination for nurses - two related to practical nurses and one to associate degree nurses.

Wrigley (1970) studied the degree to which the licensure examinations measured on-the-job performance. The research did not question the content validity or reliability of the licensing examination. The subjects chosen had worked no less than six months and no more than two years in hospitals accredited by the American Medical Association. Each subject was rated by at least two different supervisors. The instruments selected were the National League for Nursing licensing examination and an adaptation of the descriptive rating scale used by the United

States Employment Services. The latter was adapted to an interval scale of twelve items, one of which was an overall ability measure. The items dealt with absenteeism, dependability, quantity and quality of work, knowledge, adaptability, versatility, self-improvement, use of time, professional interest, amicability, and the overall ability item. The population consisted of 107 licensed practical nurses, each of whom was rated by a minimum of two registered nurse supervisors who had worked with her (all were female). All of the participants had graduated from programs under the auspices of the Alabama State Department of Education. The Henmon Nelson test was used as the measure of mental ability. The range of scores on the licensing examination was from 450 to 690, with the middle score at 521.6. The average total scores on the descriptive rating scale for on-the-job performance was 42.72 with a range from 30 to 70. Five of the subjects had failed the licensure examination on their first try. They were employed under conditional arrangements.

The following findings were reported: there was a slight tendency toward high scores on the licensing examination; the total scores on the on-the-job performance scale also had a tendency to be high; when the total of the performance scale for each subject was compared with the licensing examination scores, no relationship was evident; a comparison of selected items on the performance scale with the licensing examination showed a negative relationship; and the licensing examination did not measure job performance. The researcher concluded that the low relationship between the licensing examination and both the total scores on the performance scale and the items of the scale point not only to a difference of content but also to a difference of educational objectives.

Tomlinson (1971), in a longitudinal study of practical nursing, studied validity of the licensure examination as an appropriate measure of nursing competency. Data were obtained from school records, interviews, structured data collection sessions, and questionnaires. The population was students in forty-five cooperating practical nursing programs. The following results were reported: practically all of the new graduates entered employment as licensed practical nurses in a wide range of assignments and activities; the educational programs were generally inadequate to accommodate all applicants; a large number of applicants were in need of refresher and remedial education services; and many needed financial aid in order to complete the program.

Wilson and Packwood (1975) conducted a follow-up study on the job performance of nursing graduates in order to identify the strengths and weaknesses of the nursing program at Delta College, University Center in Michigan, and to investigate the predictive relationships between grades, nursing board scores, and rated job performance. The methodology consisted of separate item analysis for each original scale which consisted of sixty-two items arranged in six areas of nursing performance. The method of item analysis used involved the computation of the Pearson product-moment coefficients among items, subtest weighted mean scores, and total test weighted mean scores. Results of the item analysis supported the basic design of the instruments. The researchers reported that the revised scales would allow their continued use for the purpose of identifying curriculum strengths and weaknesses as long as the content of instrument validity reflected the objectives of the nursing program and expectations of employers. These scales were used for program evaluation and reported by Wilson and others (1977). The results showed that there was no relationship between grade point averages, state board examination scores, and job performance of nursing graduates as rated by physicians and supervising nurses. They also noted that strengths and weaknesses identified in job performance were greatly influenced by personality traits and were essentially unrelated to cognitive skills.

Maynard et al. (1972) compared student performance in an occupational therapy assistant course with subsequent on-the-job performance. The students in the course conducted by the Division of Mental Hygiene of the Wisconsin State Department of Health and Social Services received separate grades for academic courses and practical experiences which were averaged together for one course grade. All had to be employees in various facilities for the mentally ill and mentally retarded and were selected while they were enrolled in the course. The administrators requested guidelines to help them select appropriate candidates; the study was designed to assist them in the selection process. The methodology involved an analysis of student characteristics, their performance on the total course, and their subsequent on-the-job performance. The independent variables were age at the time of enrollment, years of schooling prior to enrollment, prior experiences in a hospital, prior experience as an occupational therapy aide, and grades from the academic and practical experience. The dependent variable was subsequent on-the-job performance, obtained from a questionnaire completed by administrators or supervisors in the hospitals where the former students were then employed. Information on the questionnaire included relationships with patients (motivation, understanding of patient problems, and effectiveness in patient care); relationship with the staff; ability to supervise; ability to organize and implement activities; and general personal

performance (completing assignments, following directions, giving constructive suggestions, being on time, flexibility, humor, and other factors). Analysis was by means of Pearson product-moment sample correlation. The correlates with job performance and intercorrelations among independent variables were discussed in the findings.

The findings relating to correlates with job performance included the following points: There was a small but definite relationship between job performance and practical experience grades; implying that students who performed well in the practical phase of the occupational therapy assistant course would have a tendency to perform well on their future work. Grades earned in the theoretical phase of the course predicted subsequent job performance but less than the practical experience training phase. Experience in the field prior to taking the course showed a very low positive relationship, and years of schooling prior to enrollment of the students yielded no correlation with job performance. Findings relating to intercorrelations among variables included the following points: the highest intercorrelation was between the academic grade and the practical experience phases of the course; experience as an occupational therapy aide prior to taking the course showed a low negative intercorrelation with years of schooling; a moderately high positive intercorrelation was noted with the practical experience phase of the course and the academic phase; and years of schooling was an irrelevant factor as a predictor for on-the-job performance. Among the conclusions were these points: practical experience training grade was a small but definite predictor of on-the-job performance; the course grade achieved in the academic part of the training program was also a small predictor but at a lower level than practical experience; and there were no indications that years of academic schooling were relevant to job performance and practical experience grades.

Program Effectiveness

The National Committee for Careers in Medical Technology (1969) studied the work experience of certified laboratory assistants (CLAs), using a questionnaire with 3,282 individuals who had been certified by the Board of Certified Laboratory Assistants since certification began in 1965. The response rate was 29 percent. The following findings were reported: the CLAs were being utilized in a wide range of duties including teaching and supervision; independent operation of laboratories (such as being in charge or having minimal supervision) was reported; the training as outlined in the "Guide Book for Approved Schools of Certified Laboratory Assistants" was perceived to be at least adequate; a high interest in continuing education was reported;

some respondents who had studied and worked in the armed forces had received a longer period of training than those who had attended CLA schools; and personnel in the armed forces desired responsibilities above the level of the CLA.

Kupel (1974) studied the extent to which the education provided by the Medical Laboratory Technician program at Western Wisconsin Technical Institute had benefited the graduates and their employers. Questionnaires from twenty of the twenty-two graduates and fifteen employers were used. Their responses indicated that the program was meeting the needs of both groups with a high degree of success; skills and knowledge learned in the program were being used by graduates; employers rated the graduates' potential for professional advancement between average and excellent; and the graduates indicated satisfaction with their chosen profession.

Gold (1972) studied the effectiveness of a radiology technology program at Los Angeles City College. Four sources of information were used: student performance on the examination results of program completers on the American Registry of Radiological Technologist; follow-up data from questionnaires sent to 203 graduates who received an associate of art degree in radiologic technology; opinions of local hospital administrators; and records of students who failed the registry examination. Among the findings were these five points: (1) average performance on the registry examination was about equal to that of other examinees in California and better than nationwide examination scores; (2) the grade point averages appeared to be a good predictor of their registry examination scores; (3) passing the registry examination was related to success in the anatomy or physiology course; (4) program completers were generally pleased with the educational program; (5) local administrators reported a high regard for the program.

Several other studies dealt with specific programs, as described below:

1. Health careers. Williams (1975) conducted a follow-up study of 128 secondary school students who had completed a health careers course. Former students were surveyed by questionnaires to determine program effectiveness and means of program improvement. Eighty-seven percent of the students responded. The data indicated that 48 percent of the respondents were employed in the field in which they had been prepared; part-time work experience while still a student increased the related employment rate to 80 percent, part-time work experience increased the percentage of students who sought additional education; the program aided 88 percent of the students in making

career choices; 79 percent of the students felt prepared for occupational experiences; and a high degree of job satisfaction was reported. The researcher concluded that the program was effective in meeting its objective. However, the need for more hands-on experiences during class was suggested.

2. Dental auxiliary. Gold (1975) conducted a follow-up study of the dental hygiene graduates of Los Angeles City College. Forty-seven graduates completed a questionnaire designed to provide feedback information. The findings indicated a number of points, for example, practically all were employed as dental hygienists; the number of patients seen per day ranged from four to twenty; most participated in continuing education courses, especially one-day conferences; most were employed only in dental hygiene work (although about 10 percent also worked in periodontic and pedodontic areas); over 90 percent performed the tasks of scaling-root planning, polishing, and plaque control (most felt competent in these tasks); and they felt least competent in certain types of radiology work and curettage.

Armstrong (1977) studied employment patterns of registered dental hygienists in southern Maryland. The survey attempted to determine if hygienists who sought employment were able to find suitable positions; 397 participants received questionnaires and 82 percent responded. The picture of the Montgomery County (Maryland) dental hygienist which emerged from this survey was of a generally well-paid individual who worked part-time by preference. Many hygienists in the twenty-six to thirty-five age bracket voluntarily left the work force, sometimes to return later. Fifty-nine or 20 percent of the respondents expressed opposition to the establishment of a dental hygienist program in the county on the grounds that numerous hygienists seeking work in the area were unable to find positions.

3. Medical assistant. Licata (1977) evaluated the fourth year of the medical assistant program at the Takoma Park campus of Montgomery Community College in Maryland. The findings included the following points relating to the qualitative aspects of the program: 98 percent of the physicians judged their employees adequate or well-qualified; the majority of the graduates found their training appropriate and related to their jobs; and all supervisors surveyed reported that the training was adequate, indicating that they would rehire present employees or other Takoma graduates.

4. Nursing. Padilla's (1974) follow-up study of Los Angeles City College graduates attempted to evaluate the program's effectiveness; counsel students in the program; answer questions of legislators, accrediting bodies, and other interested groups; and improve the quality of education at the college.

Questionnaires were sent to all of the seventy-eight graduates of the 1973 program, eighteen (23 percent) were returned. The responses showed that the graduates had little trouble finding employment in areas of nursing which they preferred and that starting salaries were good. A comparison of scores on the State Board Test Pool Examination between the 1973 graduates and the classes of 1958 through 1962 showed that the department was preparing students as well in 1973 as it was previously.

In a related study, Padilla (1974) compared results of the 1974 State Board Test Pool Examination with the average test scores of the nursing classes of 1958 through 1962 and 1973. Results of the survey indicated that there was still a great demand for registered nurses and that forty-nine of the fifty-two respondents found full-time employment. This same research design was used the following year by Padilla (1976) to compare the achievements of the 1975 graduates to those of the two previous years. The 1975 graduates did not do as well as the preceding two classes which had pass rates of 95 percent and 96 percent respectively. Nevertheless, the results indicated that all were employed, most as team leaders, and most were employed as medical/surgical nurses. Most graduates felt that the teaching staff and medical/surgical training were program strengths, but that more experiential training was needed.

The training for new roles, types, or levels of nursing personnel was one of three projects reported by the Research Medical Center (1974) of Kansas City. The objective was to gather data relative to the postgraduate vocational and educational activities and future plans of the graduates for the 1968 to 1972 period. The study was divided into two parts. Part one outlined the results of a questionnaire sent to the graduates as well as input obtained from the school's director and the medical center's assistant director for patient services. Part two reviewed the responses relating to potential implications for the curriculum and formulated recommendations based upon comments made by the graduates.

Bloom (1975) conducted a survey of senior students in hospital schools of nursing. More than 11,000 students in 388 schools returned a questionnaire dealing with career goals, career guidance, and individual information. The major findings were that a large percentage of seniors expected to continue their education either upon graduation or in the future; that the majority who had accepted job offers selected hospitals as their first employer; that clinical experience appeared to influence the choice of a specialty; and that most students were willing to work in manpower shortage areas.

Scott (1975) surveyed a group of forty-one registered nursing graduates as part of a nursing education follow-up study. The following year the group was resurveyed in order to compare the perceptions and aspirations reported earlier. The initial findings were that the graduates had encountered no difficulty in finding employment; that acute hospital nursing was the present and anticipated future type of employment; that all had encountered on-the-job orientation in their hospital jobs; and that most felt the orientation was effective. Enthusiasm had not diminished according to the responses received a year later. However, only 57 percent rated their total nursing program adequate as it pertained to the real world. Other findings were that most respondents desired continuing education courses, particularly in coronary care, and most nurses were enthusiastic about their jobs.

5. Operating room technology. Phillips and Lucas (1977) conducted a follow-up survey on the employment of graduates of the operating room technician program at William Rainey Harper College in Illinois. The following findings were reported: over 51 percent of the forty-one respondents had some college work prior to Harper enrollment; approximately 64 percent were currently employed full time; 82 percent were employed as operating room technicians; 12 percent were employed in health-related fields, and 66 percent held jobs within the Harper district. Graduates were most satisfied with their present work and least satisfied with the future potential of their present jobs.

STUDENT SERVICES

INTRODUCTION

Faced with legislation related to education for youth with special needs and institutional policies of open admissions, faculty in programs in health occupations education were interested in obtaining information to assist the decision-making process. Variables such as characteristics of students, admission processes, and attrition were addressed by researchers. The studies are reported in four sections. Researchers attempted to answer the following questions: What variables or combination of variables placed applicants in a risk category? What characteristics could be used as predictors of program completion? What approaches should be used for describing attrition? What supportive services or other institutional factors should be provided for students identified in risk categories? Under what conditions should "controlled selections" be utilized?

STUDENT CHARACTERISTICS

Several studies related to the need to look at variables which could be used as predictors. All except one dealt with student characteristics. The American Council on Education (1974) reported a three-phase study on trends and career changes of students. From annual surveys of higher education institutions, data were obtained on freshman classes. Health career aspirants were compared to nonhealth aspirants and trends over a six year period were identified. Patterns associated with stability in, recruitment to, and defection from a major in the health field were analyzed. The council's report concluded that such factors as demographic attributes, socioeconomic backgrounds, academic ability, self-image, values, and institutional characteristics played an influential role in student choices of a probable major, actual major, career, and specialty within a career.

In order to ascertain differences in the area of nonintellectual characteristics among students and successful practitioners in four paramedical groups, Campos (1970) analyzed data by administering the Edwards Personal Preference Schedule. The test, measuring the relative strength of various personality needs, was administered to 396 subjects representing registered nurses, licensed vocational nurses, medical assistants, and dental assistants. The analysis indicated that there were significant differences in personality needs among the four paramedical vocations: the registered nurse group appeared to need an occupational environment allowing room for achievement and leadership; the licensed vocational nurse group and the

medical assistant group showed a high need for order; and the dental assistant group appeared to need a semisocial occupational environment providing interaction with others on an effective level.

The Division of Dental Hygiene in the University of California School of Dentistry in San Francisco and the Berkeley Counseling Center investigated preadmission characteristics of prospective students in a university-college level program. Frank and Kirk (1970) reported that the study sought to identify attributes of applicants which would be related to clinical training and performance, this allowing predictions to be made on clinical experiences as well as academic grades. Data on students from nine classes were collected. The academic performance of the participants was found to be predictable from the preadmission grades. Neither prior grades nor aptitude and personality tests given to the applicants before admission were successful in predicting clinical performance as measured by grades given in the program. Data were collected in order to differentiate characteristics which distinguished applicants to dental hygiene who qualified on criteria from the general population of college females. Analyses of these data included the following points:

- On the Strong-Vocational Interest Bank for Women for three successive graduated classes, those who were tested as applicants were said to be more career than domestic oriented.

- Data on the mean profile of the California Psychological Inventory suggested a psychologically strong, well-adjusted, socially out-going group of students who gave evidence of being able to conform and fit conservative social values.

- Scores on selected tests in the Dental Hygiene Aptitude Tests (including science, social studies, number ability, a test of mechanical ability, a paper form board test, and tweezer dexterity) were compared with supplementary tests given for the prediction study. Results indicated that prospective students were especially strong in science. This test, however, showed no correlation with the prediction study's criteria. It was noted that superior three-dimensional visualization and technical adaptation were appropriate prerequisites.

The researchers pointed out that counselors should bring dental hygiene as a profession to the attention of female students who had the following characteristics: relatively strong abilities in science, good spatial visualization, and facility with numbers; interest in applied natural sciences at a technical rather than a theoretical level; low interest in linguistic, sales, and merchandising activities; and social poise, good

social adjustment, and a high achievement orientation. The findings suggested that grades need not be exceptional for students to be given consideration for admission.

Muhlenkamp and Parsons (1972) reviewed forty-eight studies on the characteristics of nurses. Their intent was to synthesize the major research findings of the 1960s in terms of motivational and birth order factors relating to the choice of nursing as a career; personality characteristics of undergraduate, graduate, and professional nurses; performance in school, on state board examinations, and on the job; and values and interests of nurses. The findings showed that nurses were usually older in the family birth order. Females indicated that working with people and the fact that they wanted to be a nurse from an early age were their reasons for becoming a nurse. Males indicated that the desire to help people, not being able to go to medical school because of finances, and viewing nursing as a steppingstone to administration were their main motivating factors.

Treece (1969) explored factors characterizing persons who had selected practical nursing as a career, the satisfactions of those who remained in the field, and the reasons some individuals had left. All of the graduates of the twelve practical nursing programs in Minnesota for three years were sent questionnaires. Eighty-eight percent of the 1,139 participants responded. The researcher drew several conclusions; for example, graduates had post-high school educational experiences, were supportive of their vocational choice and were inclined to criticize some aspects of their practical nurse programs. Decisions to enter the field were made relatively late. Vocational choice seemed to be based on personal interests. Persistence in practical nursing was more likely when the graduate was single or widowed or felt "fairly well accepted" by the community. Continuation in a specific practical nursing job was more likely when there were definite expectations of advancement. The licensed practical nurses' greatest vocational problems seemed to be their ill-defined role.

Maynard et al. (1974) studied student selection, program evaluation, and management decision making. They proposed a student information system incorporating a cross section of student characteristics to provide a basis for longitudinal analysis and an examination of changes in students. Suggested data to be used included standard biographical information, achievement test scores, and information obtained from a required test battery on vocational interest, personality, and motivation.

The National League for Nursing undertook a longitudinal study of men and women who entered nursing schools in the fall of 1962 (Knopf, 1970). Data were obtained by questionnaires completed at entrance to the program, upon graduation, and one and five years

after graduation. Knopf reported the following items: age, marital status, and number of children were closely related to the working status of practical nurses who had remained in the work force after five years; the younger the participants were at admission to the practical nursing school, the more likely they were to withdraw from the work force during the five year period after graduation; family income reported at admission was statistically related to working status, that is, the youngest group at admission came from families with higher incomes; and the social index and working status of the nurse's spouse were related to the nurse's employment.

Recommendations included the following three points:

1. A composite picture of entering students most likely to contribute to the health labor force as practical nurses five years after graduation would be women who were twenty-five years of age, married to unskilled workers from modest to low economic family settings, and whose life patterns showed signs of stability.

2. The role of practical nursing as an occupation for members of minorities should be studied in greater depth.

3. While there were few male practical nurses in this study, it was evident that the salaries reported would not be adequate for married men.

Knopf (1972) reported information on students in baccalaureate, diploma, and associate degree programs. The purpose was to obtain information on the biographical characteristics of nursing students, their occupational goals, and their reasons for choosing nursing as a career. The population was 42,000 students; data on freshmen who entered the three types of programs were obtained by questionnaires and coded.

The following highlights of the study were as follows:

- Associate degree students differed from the baccalaureate and diploma students in several respects; for example, their age range was wider; slightly more men and more black students entered the associate degree nursing program; and a greater proportion of the associate degree students ranked in the lower half of their high school class.

- Almost all students entering baccalaureate and diploma nursing programs were women under twenty years of age, single and white; however, over the three years of the study the proportion of black students in baccalaureate programs increased slightly.

- Expressed motivation for entering all three types of programs included helping others, having a profession, and gaining personal satisfaction. The associate degree nursing students frequently chose that program because they could complete it in less time. The diploma students stated most often that they were attending good schools that would better prepare them than the other programs. Baccalaureate students expressed the desire for both college and nursing educational experiences and often stated that the baccalaureate was necessary for a career in nursing.

In terms of graduation and withdrawal, the following points were noted:

- Statistical analysis revealed that attrition in nursing schools should be examined by program type.

- The only significant relationship was that academic standing in high school was related to graduation or withdrawal.

- In all three types of programs, the reason for withdrawal given by the directors of programs and the students themselves were statistically related. Two approaches to attrition in nursing were suggested; namely, there was a need for "an all-out attack" on prevention of scholastic failure and the need existed for each school and each type of program to study its specific problem.

Knopf (1975) later further analyzed the data obtained from students in the three types of nursing programs. The 1975 study compared students who graduated and who withdrew and analyzed the reasons for withdrawal. The following points were noted:

- The rates of graduation of students appeared to differ by type of nursing program; it ranged from 53.6 percent for baccalaureate to 69.7 percent for the diploma school.

- The statistical relationship between biographical variables and graduation/withdrawal rates differed for the three programs. Associate degree students who were older and married had higher rates for graduation than younger single students.

- The variables of ethnic group identification, family income, and high school academic standing appeared to be related to graduation/withdrawal from nursing for all three types of nursing programs.

- High school academic standing appeared to be a predictor of grades in college and in nursing schools.

. In terms of attrition, there did not seem to be any means of determining if controlled admissions to nursing schools by selective procedures resulted in a better prepared graduate or simply a lower attrition rate.

Several recommendations were made; for example, enrichment through tutoring and counseling programs should be provided for students at the risk category on biographical variables; those who leave for nonacademic reasons should be encouraged to consider "divided" education (i.e., keeping knowledge updated and making credits for completed courses easily transferable); and the behavior of withdrawal before graduation should be studied within the context of social systems.

ADMISSIONS

Admission selection committees in health occupations education have been confronted with choosing to fill relatively few openings from a large number of applicants. Such institutional factors and/or forces which encourage increased enrollments and other forces (such as pupil-teacher ratios and clinical facilities) impinge on the decision-making process. Several researchers reported on studies dealing with the process of selection.

Schimpfhauser and Broski (1976) examined the relative strengths and predictive relationships among the cognitive measures (ACT subscores, preprofessional grade point average, and Allied Health Professions Admissions Test subscores) and first-year academic success in allied health curricula. The authors reported that professional grades appeared to be the strongest single prediction variable.

Keene (1968) conducted a follow-up study of registered nurses, who were graduates of the nursing program at Foothill College in California. The purpose was to identify the characteristics which distinguished students who completed the program from those who did not, to analyze scores on the state licensing examination for nurses to determine what significant differences existed among graduates, and to obtain feedback for program improvement. Data were collected from records of the forty-five graduates and forty-one dropouts and from questionnaires completed by sixteen of twenty-one selected graduates. Prior to the study, admission selection criteria included a high school diploma and a minimum grade point average of 2.0; a minimum composite ACT score of 15; a minimum grade of "C" in high school chemistry; and a personal interview. Results of the study indicated that students with a high school grade point average of below 2.0 and those with ACT composite scores of below 15 were poor risks. The following

decisions were made: the grade point average of 2.0 and a minimum composite ACT score of 15 were retained as admission criteria; and the chemistry prerequisite was restated without specific reference to minimum grade. The study found that the 1966 dropouts left the program because of academic failure, whereas 1967 dropouts left because of dissatisfaction or alienation.

Blume (1976) addressed admission criteria in a report on the development of a biographical data inventory (BDI) and a standard form which were administered to practicing medical technologists and senior students in medical technology. A correlation of 0.68 between scores reinforced findings of other studies which suggested that the inventory was useful in advisement and student selection in allied health professions.

Models for admission processes in Virginia and Texas have been described for programs in dental assisting, dental hygiene, mental health, nursing, and radiologic technology. A health technology admissions evaluation system (HTAES) was developed at Virginia Western Community College and reported by Houston and Sellers (1977). Factors such as high enrollment demands, limited institutional spaces, and high program costs necessitated the development of a computer-based information system to collect, summarize, and rank data about each applicant. Four prediction models used in determining probability estimates of program completion were developed. These were a Bayesian model on the estimation of probabilities of program completion; a counselor model on the estimation of probabilities of program completion; a program head model for predicting first quarter grade point averages; and a classical statistical model, a linear model based on traditional data use and used for predicting first quarter grade point averages. HTAES was designed to provide for an orderly, computer-based processing of applications for each of the five health technology programs. The system was triggered by the applications for admission. When the admissions information was complete, the Counselor Data Form was automatically distributed; when it was completed, the Program Head Composite Form and Institutional Research Evaluation Data Form were distributed. A summary was prepared which was used by the selection committee, who had the responsibility for the final guidance/selection decisions for each applicant to the health technology programs.

At the request of the Air Force School of Aviation Medicine, a project was designed to evaluate the screening process used for entry into the medical training courses of aeromedical specialist, environmental health specialist, and physiological training specialist. The development of this screening methodology was reported by Leisey and Guinn (1977). A sample of

1,003 students was administered the General Aptitude Index of the Armed Services' Vocational Aptitude Battery, the Otis-Lennon Mental Ability Test, the vocabulary portion of a word clue test, and the reading speed and comprehension measures of the Appraisal of Reading Versatility Advanced Test. Biographical data on each trainee were obtained. Three models were developed from these predictor variables: Model 1 contained all test and biographical data. Model 2 contained only the data from the commercial tests. Model 3 contained only data from the ASVAB (Armed Services Vocational Attitude Battery) and the biographical data. It was concluded that Model 1 was the most useful in identifying potential failures and personnel requiring remedial training in medical technical courses, and that the significant contribution of the commercial tests to the predictor composite warranted their retention in the selection composite even though their use entailed an additional expense.

El-Din (1977) presented a model of the organization of the admission procedures in the School of Allied Health Sciences at the University of Texas Health Science Center in Dallas. The committee purposes and the working relationships with the program, the administration, and registrar's office were outlined. In addition, Lind (1970) reported a study pertaining to applicants for training in occupational therapy and concluded that more research was needed on predictive measures.

YOUTH AND ADULTS WITH SPECIAL NEEDS

In a study of a geriatric aide program at Trowbridge House (1971) in Hudson, Ohio, researchers sought to demonstrate - whether active and positive recruiting methods used by proprietary schools could be adapted to obtain more and better qualified disadvantaged persons for skills training; whether a high quality, prevocational independent study which presented motivational and communication skills could be combined with traditional classroom and laboratory hands-on training to produce trainees who were better adjusted, more highly skilled, and more personable; and whether close relationships between the trainee and program coordinator would result in high placement. The program included classroom and laboratory training and supervised work experience in a nursing home. The trainees were evaluated with daily quizzes, weekly tests, and a final examination at the end of the six weeks spent in the skills center. The following conclusion was drawn: providing some means by which disadvantaged persons can exercise more initiative and choice in selecting their career objective and training program significantly altered their performance when enrolled in a Manpower Development Training Act (MDTA) program and in subsequent job performance. In addition, active selective and positive recruiting methods allowed more efficient "loading" of

MDTA skill training classes. It was recommended that the program be packaged to be used in other skill centers, especially those which have heavy enrollment in their patient care facilities. This program used clinical facilities for less than half the time required in a typical program.

Sparks and Gizis (1972) studied the diagnosis of entry level skills and the prescription of an appropriate developmental program at a community college in the South Bronx, a unit of the City University of New York. The college operated under the open enrollment policy, served a large black and Puerto Rican student population. With the influx of less academically qualified students it had to compensate for divergent entry-level skills of students by establishing different approaches to instructional systems. The health science programs included nursing, dental hygiene, medical laboratory technology, early childhood education, radiologic technology, medical secretarial science, and a health core. A preliminary step in designing the diagnostic testing and skills development program was to analyze the difficulty level of the texts currently used and compare it with the entry level vocabulary (ninth grade) of the students. Thirteen textbooks, two journals, and one test from the seven professional areas taught were selected for analysis.

The findings were that the average readability level of the textbooks was at the fourteenth grade; that within a given book, the difficulty varied by chapter and frequently within chapters by at least five grades; that the overriding variable on readability was vocabulary usage; and that the one cultural factor that influenced the low level of vocabulary usage was the large number of predominantly Spanish-speaking students. The researchers recommended a systems approach of substituting the "completed" or "incomplete" grade for a grading system of A to F. They stated that a grade became superfluous when all the behaviors have been satisfactorily completed for performance objectives, milestones and modules, and built-in loop back remediation steps. However, if these were not systematically observed, some form of assessment or scoring was necessary.

The American Society of Allied Health Professionals, through the sponsorship of the Division of Associated Health Professions, Health Resources Administration, held a conference which addressed the barriers faced by minorities seeking training in the health professions. Samuels and Buckner's report of this conference (1975) included the papers, workshops, and pertinent recommendations. The data provided for the national meeting was gathered from various regions of the country during a two-year period and showed, by regions, the barriers encountered by blacks, Native Americans, and students with Spanish surnames who had attempted to enroll in health professions. The following barriers were indicated: need for financial assistance; need for

role models; poor academic preparation and lack of tutorial services; lack of career information and counseling; and cultural and social gaps. The following recommendations were presented: initiation of a national, comprehensive allied health human resources development program; development and enforcement of a strategy to identify and remove culturally biased admission criteria and procedures; public or private resources for training programs and registration in a profession by minority students; development and implementation of advocacy programs to overcome barriers to minority students entering the allied health professions; and allied health traineeships.

Regional Studies

Murray (1975) conducted a study on barriers to allied health professions in the Southwest. Its purpose was to identify barriers experienced by minority groups on entering and completing a postsecondary education program. Data presented were obtained through conferences where students, dropouts, nonstudents, staff, faculty, and administrators participated, and by an examination of demographic and human resource information. The participants ranked the barriers according to their importance for each minority group, Hispanics, Native Americans, and blacks. The main findings regarding priority barriers were summarized for the faculty and student sessions. The faculty ranked the lack of appropriate counseling at the high school level; minority student failure to meet institutional and programmatic admissions requirements; financial need; and the lack of basic skills in verbal and written communications, the sciences, and mathematics as priority barriers. The students ranked financial need and the lack of financial aid, the lack of high school counseling, the allied health curriculum structure and course content, bias against and stereotyping of minorities by faculty and staff, admission requirements, and academic preparation as barriers. Both agreed that, in regard to the stages involved in achieving professional status in an allied health career, the most serious barriers occurred in the application stage.

Several Southeastern states (Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, and South Carolina) provided the focus of a study to identify the barriers to minority groups which have resulted in underrepresentation in allied health professions postsecondary education programs. The report by Elser (1975) included data obtained from conference participants as well as administrators and faculty from allied health schools who were unable to attend the discussion groups. The major problems identified related to information, counseling, recruitment, finances, and motivation. Recommendations focused on basic information needs and the issues around which potential program alterations could be developed.

Whittington and Benson (1975) also studied the barriers which prevented application to, matriculation in, and/or completion of allied health postsecondary education programs by blacks, Spanish surnamed Americans, and Native Americans. Only those barriers which could be resolved or reduced through programs of public information, outreach, and training were identified. The study was limited to states in the Northeast (Maine, Rhode Island, Vermont, New Hampshire, Massachusetts, Connecticut, and New York). Group sessions were conducted with students enrolled in programs in allied health; faculty, staff, and administrators of postsecondary allied health programs; and minority professionals working in allied health. The discussions were analyzed in two ways: objective analysis of barriers and content analysis of underlying thoughts and feelings. The findings indicated that most minority students did not include the allied health fields in their career selection process because they either had no knowledge or inadequate knowledge of the career opportunities available; and those who did enter postsecondary programs found the academic work difficult, sensed a feeling of social isolation, and seemed unable to get the supportive services needed to successfully deal with their environment.

Martinez (1978) studied ethnic minorities in the health sciences at the University of Utah. The survey was conducted to determine the number of blacks, Hispanics, Native Americans, and Asian Americans enrolled in each college of the university; minority recruitment and retention programs; and the reasons why it was believed that minorities did or did not choose the respective college in which to matriculate. The following findings were presented: few nonhealth science colleges came close to having an equivalent percentage of minority students enrolled in the programs as there were minorities in the state; the majority of the colleges did not have minority recruitment or retention programs; however, since 1969, the colleges of pharmacy, medicine, nursing, and health had participated in various programs to increase the number of minority students and faculty; and the College of Medicine had the best success rate in terms of admission and retention programs for minorities.

Golstrom et al. (1976) studied college freshmen interested in health professions. They reported that there was a 37.4 percent increase in aspiring health professionals during the eight year period of the study. The career choice of physician claimed nearly half of the college freshmen, followed by veterinarian, dentist, pharmacist, and optometrist. In 1974, only one in three aspiring health professionals was a woman, one in twenty was black, and one in twenty belonged to racial/ethnic minority groups other than black. These figures represented dramatic increases over 1960 in the number of women and minority group members. The aspiring health professionals generally came from more affluent backgrounds and were better educated than the

average freshmen. In addition, a second volume of the study reported data on college freshmen interested in nursing and allied health.

The Division of Physician Manpower (1970) of the National Institute of Health conducted an evaluation of the use of the radio as a means of recruiting minority students in the health fields. Methodology included selecting eleven schools in the San Francisco area to participate in a program of weekly radio broadcasts. Meetings were held with school repersentatives to discuss topics, objectives, and other technical matters. Each broadcast used the format of a combination panel and question-answer period. A follow-up survey was conducted at the conclusion of the broadcasts. Although statistical data were incomplete, the project staff reported that the programs were effective in terms of producing interest and enthusiasm. This was especially true in those schools where faculty and administrators took a personal interest in helping disadvantaged students examine their interests and capabilities. The results demonstrated that such a technique could serve as a means of recruiting disadvantaged students into the health professions.

COUNSELING SERVICES

Although the need for supportive services for high risk youth and adults has been cited by several researchers, few studies explored the effect of the developmental programs on student performance. However, several reports about the provision of counseling and articulation procedures were cited. Johnson and Leonard (1970) studied seventy-seven students enrolled in the Core Concepts in Nursing program at the University of Wisconsin. Forty-one were transfer students; all were female. Each student completed a personality factor questionnaire. The experimental conditions included assigning the students at random to eleven groups. Six of the groups were randomly assigned to participate in group counseling sessions; the remainder were used as control groups. The counseling sessions were designed to help students be more sensitive to feelings and attitudes, especially as they related to clinical experiences. The hypothesis developed was that the students assigned to the counseling groups would perform better than students in the control group. This hypothesis was supported. The researchers concluded that group counseling apparently aided the students in the performance of their hospital field work assignments.

Peterson (1970) studied professional counseling programs through the extension office at the University of Wisconsin (Marshfield-Wood County campus). The need for such a program was demonstrated when nurses made inquiries about available courses

in local areas, challenge examinations, and similar topics. The program was managed under individual appointments. It was felt this arrangement was necessary because preparation, experience, and aspirations varied; the nurses were employed and needed to be able to arrange appointments at their own convenience; and counseling was considered to be a very personal matter and questions might not be asked in a group setting. Questions asked most often concerned transfer and acceptance of credits from or to other institutions including foreign schools; elapsed time and subsequent changes in curriculum requirements and interruptions of career plans; the choice of a particular specialty or area of concentration within the major field of nursing; changes in plans as a result of maturing and/or family experiences; suitable courses (credit and noncredit) which were available; challenge examinations available and preparation for them; and certification requirements in specialized nursing areas. Local counseling sessions were judged to be helpful for two reasons: nurses received authoritative information which helped them in planning continuing education activities and in deciding about completing work for a degree; and counselors learned about the situation among their colleagues away from the academic setting. Some nurses, after realistically assessing the demands of home, family, job, and classroom, deferred or abandoned thoughts of further formal education. Others found they were nearer their goal than they had thought. Help in the decision-making process was considered to be a great advantage of a well-designed counseling program which helped nurses to identify alternatives and to choose wisely.

Boatman and Huther (1975) conducted a study to develop procedures to enable individuals to transfer credit from an allied health program in one setting to some program in higher education. The sponsoring agency for this project was the Division of Associated Health Professions of Health Resources Administration. This articulation project discussed barriers to educational mobility, problems affecting transfer of credits, policies related to transfer of credit, and three curriculum models.

STUDENT LEADERSHIP ORGANIZATIONS

The need for a vocational leadership organization for students in health occupations education (HOE) has been addressed by the Health Occupations Education Division of the American Vocational Association. In 1971, a task force was appointed to study student clubs, to determine how they might serve HOE students, and to examine whether or not a new organization was needed. The following year a report of the task force was submitted (Navara 1972).

In a related report, Tomlinson, Gillespie, and Kerr (1972) made the following points:

- Student organizations can serve a valuable role by supplementing the formal education program, thus enhancing the further development of the individual student.

- Participation by the individual student must be on a voluntary basis.

- Student organizations should provide for meeting both the broad common needs and interests of all occupationally oriented students and more specialized needs and interests of students interested in careers in the health fields.

- A successful student organization requires appropriate sponsorship, effective leadership, and adequate and continuing support.

- ...the nature and relationships of student organizations should be determined at the state and/or local level. The HOE Division of AVA should serve a facilitating role in assisting the various state and/or local groups to develop the type of organization each deems most appropriate in their setting.

During the following year, four states organized leadership organizations for students enrolled in health occupations education. It is interesting to note that the members of the HOE Division sought to use the word "student" rather than "youth". The HOE leaders recognized that because so many adults were enrolled in health occupations education, this change was appropriate.

Turning to the research in this area, the authors of this paper found a dissertation study by Mack (1973) to be most valuable. Mack attempted to identify and analyze selected current issues in health occupations education. The issues were identified with the aid of national leaders in the field. After the issues were identified, they were organized into a tentative check list which was evaluated through a pilot study of twenty-three national participants. A final check list consisting of forty issue statements was developed. The population for the study was sixty-one leaders in health occupations education. The response rate was approximately 90 percent. In reporting the findings, the researcher organized the issue statements into three categories; content homogeneity, the respondents' opinions about the importance of the issues, and the degree of agreement among the respondents.

Two additional writers addressed the question of need. Wittman (1974) asked this question on health career clubs: Is it time for a national organization? In response, the author affirmed that definite youth leadership programs in terms of such clubs were needed to support this occupational area. Moore (1974) also indicated that health career clubs could increase public knowledge and understanding of health matters, improve the image and status of health workers, and attract qualified recruits to health occupations education programs. In addition, in its seventh report (n.d.), the National Advisory Council on Vocational Education turned its attention to vocational youth organizations and described the expanding visibility and support of student organizations. The report stated that new organizations designed to serve students in health occupations have been organized at the state level.

CAREER EDUCATION

INTRODUCTION

To appreciate the contribution career education can make toward personnel training in health careers, it is necessary to recognize the difference between career and vocational education. Career education demands certain responsibilities of teachers and counselors at all levels of schooling. The need for integrating these responsibilities into existing curriculum - rather than adding new courses - has been a challenge for many educators. Given the fact that career education begins at the early stages of the educational process, the opportunity to attract disadvantaged and handicapped students to health careers appears evident. Certainly career education should assist the various health programs to overcome traditionally imposed sex stereotyping.

CAREER AWARENESS

The Geneva Area City Schools (1974) developed a curriculum unit on hospital emergency room workers and focused it on the third-grade level. The objectives of the unit were to increase students' awareness and enhance their appreciation for the health workers. The Atlanta public schools (1970) developed a teachers' guide for four television programs designed to provide children from various socioeconomic backgrounds in grades three through eight with information concerning hospital, public health, and dental occupations. The materials also were designed to demonstrate the role of work, to develop positive work attitudes, and to facilitate realistic occupational choices. The guide described the procedures followed in developing the materials.

CAREER EXPLORATION

Health Occupations Clusters

General exploration of the many health occupations usually is planned for middle school-level students. Objective and instructional materials have been developed by many individuals and groups (Calhoun, 1972; Cincinnati Public Schools, 1973; Oregon State Board of Education, 1970; and the Pleasant Hill School District, Oregon, 1973).

The School of Allied Health Professions at the University of Connecticut (1973-1974); Smith (1974); and Fisher (1974) developed student handbooks and teacher manuals in allied health

education for grades seven through eleven. The materials varied from general basic information to indepth explorations of the various health occupation areas. Avery et al. (1975) conducted an evaluation report of the project and indicated that the program was successful in meeting its objectives. In addition, Hill (1974) and Lewis and Tanner (1977) developed guides for assisting teachers and counselors in integrating information on health careers within the existing curriculum.

Indepth Exploration and Entry-Level Skills

At the high school level, health occupations programs provide opportunities to explore various careers with more detailed laboratory experiences. This provides opportunities for students to learn entry-level job skills and to prepare them for entering postsecondary health occupation programs. Some programs emphasize the exploration of various careers by using field trips, guest speakers, and individualized units related to the functions and responsibilities of health care personnel (Coatesville Area School District, n.d.; Rosenthal and Agran, 1972; Schoenberger, 1974; Sprague, 1976; and Vose, 1973).

Entry-level skills are taught in secondary school programs in order to allow students opportunities to work upon completion of high school (Barlow et al., n.d.; Dade County Public Schools, 1971; Harding, 1974; and Lewis and Scheuren, 1975). Other programs emphasize preparing students to enter postsecondary health education programs (Akron Public Schools, 1975; Briscoe and Platte, 1972; Michael J. Owens Technical College, 1973; and Weston, 1974). These programs stress interdisciplinary patterns of instruction in English, mathematics, science, and health occupations.

Many secondary health occupations education programs are planned for two or three years in order to cover several goals. Usually, the first year is an orientation to health careers; the second year generally provides opportunities for students to learn more about several careers by rotating clinical sites; the third year allows students to spend more time in one or two areas through cooperative education arrangements (Benedict et al., 1973; Blue Hills Regional Career Education Center, 1973; Epstein, 1972; Fielstral and Rosequist, 1971; Franken, 1974; Majchrzak et al., 1970; Purdy, 1975; and the Vermont State Department of Education, n.d.). Three reports described secondary school health education programs with major goals of planning appropriate course work in the rural schools (Colgan et al., 1969; Fife, 1976; and Rowe, 1970).

Health Occupations
Education for Special Groups

Programs designed to encourage minority and disadvantaged students to select health careers are limited; however, the importance of such programs increases. Blacklow et al. (1971) reported on the Harvard Health Careers Summer Program whose goal was to encourage minority students to consider careers in the health field. Wainio (1976) outlined an enriched health science curriculum program for junior high school students which was designed to attract minority students into the health areas. Hill (1972) reported a health careers education program in which the majority of the students were from welfare families. The Institute for Services to Education (1975) designed an instructor's guide on developing effective assisting skills in counseling minority and low socioeconomic students.

A handbook designed to encourage Native American youth to seek careers in the health professions was prepared by the Association of American Indian Physicians (Jennings 1975). It described the need for Native American health professionals, emphasizing the leadership role open to those who pursue health professions in their community.

Three studies focused on the academically handicapped students (Manpower, 1971; Mincemoyer, 1975; and Turner, 1975). Their recommendations included providing funds for more comprehensive planning to help these students. The physically handicapped also need special guidance in exploring various careers. This guidance might best be provided by helping such students understand their limitations as well as by developing awareness of their abilities. This was done in studies by Mulligan et al. (1975) and Phillips (1972).

CAREER INFORMATION

Choice of occupation is, clearly, one of the most important decisions in one's life. Zuffall (1975) pointed out that all aspects of career guidance should assist an individual of any age to make their choices imaginatively and realistically. Several states have developed a career information handbook on the need for health careers at the state or local levels (Fabuille and Losi, 1970; Georgia State Department of Education, 1977; Harmon, 1968; and Idaho, 1972).

The American Medical Association (1971) published a directory for use by educators, students, and employers. It contained information on the allied health education programs which were approved by the association and other appropriate organizations.

Kralovec et al. (1977) surveyed health occupations training programs in hospitals. The findings indicated that the programs included a wide variety of types, covered a wide scope of skills, and ranged from a marginally formal to a highly structured curriculum. In addition, some states have compiled information on the educational programs within their states (North Dakota, 1973; South Carolina Hospital Association, 1970; and Trapp, 1971.)

Two directories have been published to assist Native Americans in selecting appropriate health careers (Apodaca, 1977; Health Services and Mental Health Administration, 1970). Other directories listing educational programs in a particular health area have been helpful for students to determine which school to attend for any particular health career. The American Medical Association (1974) published a directory of programs for preparing registered nurses for expanding roles; it provided a detailed listing of both long-term and short-term educational programs. Still other directories have been published which list programs to prepare physician assistants (Health Careers in Ohio, 1973; and Kacen, 1974).

CAREER MOBILITY

One major goal of career development is that students can enter and exit the career ladder as their interests and abilities allow. Health educators are concerned about the lack of lateral and vertical mobility within the rather restrictive health occupations education process (Tomlinson et al., 1970). Career mobility sometimes is hindered due to ambiguity of job titles, lack of standardized nomenclature in the field, and the continuing proliferation of job titles which do not indicate level of practice or special competence of personnel. This, in turn, hinders cooperative planning necessary for effective articulation between health occupations programs (Milliken, 1972).

Joiner and Blayney (1974) listed five general barriers to career mobility. They were as follows: difficulty in being admitted to academic programs, lack of mobility to and through the curriculum based on levels of proficiency, territorialism among categories of health workers, reluctance to move functions and skills from one category of trained workers to others, and resistance to the team approach hindering movement of skilled workers into new output arrangements.

Ward et al. (1973) studied the feasibility of health occupations career mobility in Oklahoma in a program developed to assure advancement of persons interested in expanding their competencies

and responsibilities in health occupations. Two proposed plans for career mobility were presented as well as ways to overcome barriers.

Abbott (1973) identified the following means for providing for career mobility: using common facilities and joint advisory committees for both high school and postsecondary programs; awarding credits and diplomas so that students meet requirements for the next level program; providing coordinated guidance and adult education programs; and programing designed to meet the people's needs at various stages of their career development.

Kintgen (1970) analyzed the literature on career ladders and lattices in health occupations education and concluded that articulation had been given little attention since the educational process assumed that students could - and should -choose the appropriate level program for their goals and qualifications. A related study at the City University of New York (1968) suggested that more attention be focused on formal education provided for members of the labor force during their working lives, in sequences linked with job requirements, rather than on education to be completed before entrance or while on leave from the labor force. As more emphasis is given to minority groups, the need to assist allied health workers "climb the career ladder" becomes more evident. Therefore, the American Hospital Association (1971) indicated that career mobility can help to overcome personnel shortages.

In exploring career mobility in nursing, Story (1974) suggested that a career ladder curriculum is not simply taking one level and the next of a program and placing them in sequence; the faculty must have a clear understanding of the workers' roles at different levels. Markowitz (1973) prepared an articulation plan for three levels of nursing; namely, the aide, the licensed practical nurse, and the registered nurse. Traini (1976) noted the differences in roles of the licensed practical nurse and the registered nurse; the report also discussed issues leading to the need for an articulation program.

Identification of job roles for the nurse aide, the licensed practical nurse, and the associate degree registered nurse have been developed into statewide articulated competency-based curricula by the Louisiana State Department of Education (1976). In order to assist nurse aides to upgrade their job skills to the licensed practical nurse level, a work-study program was developed by the Medical and Health Research Association of New York City (1970). In the program, 422 aides completed a fourteen month licensed practical nurse training program, dividing their time weekly with twenty hours for work and twenty-five for training. Ninety-one percent of the graduates passed the state licensing examination and returned to duty as licensed practical

nurses. Recommendations to improve the program included considering all aides as candidates, providing a center to improve basic academic skills, and providing counseling and other supportive services at the training site. The report also noted the importance of selection of participants in the work-study program. In order to raise the morale of such workers, it was deemed important to counsel those not selected and to suggest how they might be included in future programs.

Fasano (1976) described a community college program which prepared licensed vocational nurses to become registered nurses. The program stressed recognition of individual student differences and skills, individual and group counseling, and understanding of the role changes. Malone (1968) surveyed the nursing programs in Massachusetts in order to plan for nursing education. Recommendations were made to assist registered nursing students in the baccalaureate programs and to develop new policies and procedures between community and state colleges.

Other areas have begun to be concerned with career mobility. Simmons (1971) reported a conference dealing with reporting on the baccalaureate and associate degree level programs in nuclear medical technology. A study by Gilpatrick (1977) used task analysis in diagnostic radiology to describe career ladders beginning with the aide, moving to the technician, and then to the technologist. The economic rationale for job restructuring and the cost value of using job ladders also were discussed.

Meek (1971) described the use of an advisory committee to coordinate efforts and suggest directions in aiding career mobility for allied health students. The task force suggested the following needs: an area-wide consortium to provide career mobility, giving college credit to persons prepared in the military, and core curriculum development. The study by Norrell (1975) suggested three approaches: acceptance of associate-plus requirements for baccalaureate work, a bachelor of technology program, and credit for life experiences program or credit by examination. These approaches were intended to provide students in the allied health sciences with both "inter pathway" mobility and upward mobility in their education and careers.

One of the suggested ways to improve career mobility for allied health students is to give credit for prior training and/or experience. Boatman and Huther (1975) developed procedures to enable an individual to transfer credit from an allied health education program in one setting to a program in higher education. The report identified specific problems that affected transfer of credit, proposed guidelines, and discussed transfer policies and articulation agreements. In addition, the process of bringing educators together to discuss transfer and allied health problems was considered.

An Ohio conference on allied health personnel (1974) discussed the methods considered to be most effective for developing and utilizing needed personnel. Several recommendations regarding credit for training, or experiences emerged. They included the following points: development of statewide guidelines for proficiency skill and academic equivalency tests; definition of formally educated versus nonformally educated individuals; and determination of the number of students desiring transfer credit.

The National Committee on Employment of Youth (1974) conducted a symposium in cooperation with the Consortium for Occupational Therapy Education. The symposium focused on the issue of alternate routes to open-occupational therapy career opportunities for young people. The medical laboratory programs have established ways for medical laboratory workers to advance up the educational career ladder and to gain credit for prior training and/or experience (National Committee for Careers in Medical Technology, 1974.)

CONCLUDING OBSERVATIONS AND RECOMMENDATIONS

This concluding section is organized into three areas: organizational change, role recognition, and program development.

ORGANIZATIONAL CHANGE

Both the health care delivery system and the educational system are social systems. Each responds to societal expectations, each is organized around roles to meet its goals, and each has human agents to perform tasks. Each system has role expectations; each role incumbent has certain expectations and values. Societal expectations and values are articulated through legislation. This paper has attempted to review the effects of legislation on these two systems. Response to legislative efforts by the social systems have been primarily curative in nature.

1. Societal expectations for access to and public responsibility for a dual health care delivery system (for health maintenance as well as primary care) necessitate change in philosophical dimensions, program development, and role recognition and role legitimation.

2. Due to the complexity of the health care and educational systems, several planning models should be designed.

3. The response of the educational system to this change in philosophical dimensions, program development, and role recognition and legitimation should be carefully determined, planned, implemented, and evaluated.

4. Participants in the health care delivery system must be provided with advocacy, consumerism strategies, and activities designed to promote personal responsibility for decision making.

5. The management information systems for the health care and educational services need more focus on research. The former requires an information system based on lifelong utilization of health care delivery; the latter requires a system for diagnosing career decisions and recording lifelong learning. Such systems for lifelong learning and lifelong health care have implications for career, preparatory, advanced, continuing, and consumer education - as well as personal responsibilities for participation.

ROLE RECOGNITION AND LEGITIMATION

1. The delegation of authority to physician extenders and others has received considerable attention recently. Several new role incumbents in the health care delivery sought role recognition and legitimation.

2. Nursing efforts during the past decade were directed toward definition of levels of practice and professionalism. The input differences of program completers and entry levels of practitioners, the orientation of practitioners to role expectations, and the gap in expectations of employers and role incumbents have received considerable attention and resulted in unresolved issues which need exploration.

3. Health occupations education teachers must meet the role expectations of the health care delivery system and the educational system. The role expectations in each system are undergoing changes. The need for accepting personal responsibility for professional growth and development will continue to be stressed.

4. The delegation of authority (whether to take action or not) and the responsibilities of role incumbents for the authority delegated to them should serve as a career education curriculum model for entry level employment ladders.

5. Quality control in the health care delivery system (individual credentialing and program accreditation) as well as quality control in preparatory, advanced, and continuing education in teacher education needs to have a greater research focus. The relationship of quality control in either system (occupational licensing or teacher certification) should be examined in terms of job performance and role expectations.

6. The role expectations of teachers - including the role expectations as director/manager of learning - should serve as a basis for the organization and evaluation of teacher education programs.

PROGRAM DEVELOPMENT

1. As role expectations in the health care delivery system are defined in terms of role recognition, the educational system must develop preparatory, advanced,

and continuing education programs to meet these needs. Each of these must take into account occupational role expectations based on task analysis of functions, input from employers, advisory groups, and consumers; and provision for lifelong learning for career roles. Special attention should be given to involving minority groups in the health care system and to providing career mobility.

2. Patient/client education, advocacy, and patient management in the systems of health care delivery should be a program focus.

3. Program efficiency, design (including clinical experience and part-time employment under cooperative education), cost, and effectiveness need to be evaluated continuously because of organizational change and role recognition and legitimation.

4. Those accountable for program efficiency, design, cost, and effectiveness must share in the decision-making process for determining how often curriculum should be reviewed in relation to its relevancy, level of difficulty, and content of technical knowledge necessary to meet the levels of occupational role expectations.

5. All health occupations education has clinical components; however, efforts at judging the clinical competence of program completers and predictors for judging clinical competence and on-the-job performance have implications for further research.

6. Career education and resultant curriculum development have not been studied in terms of employability factors such as job satisfaction, job longevity, and modes of occupational expectations. This too, has implications for research.

7. The philosophical considerations, administrative support for change, faculty involvement, process and product evaluation, research input, and evaluation should be considered in curriculum revision. Too often the principle of "add-on" is utilized without curriculum revision. This is frequently the result of reimbursement based on the Dictionary of Occupational Titles or other funding formulas.

8. Curriculum materials often are developed as a result of legislation (e.g., metric, bilingual and career education), trends (e.g., competency-based education), or funding formulas. Usually alternative strategies for

using the curriculum materials based on characteristics of learners, learning styles, ability for self direction, and adaptation to educational settings are not provided. Teacher education programs must provide teachers with skills in decision making, in choosing instructional materials, and in determining the learning styles of students. This should be viewed as a continuous process.

9. The judgment of educational gains, that is, the difference between the present and desired level of competency should be accompanied by the delegation of authority for making formative assessments during the process of learning and summative assessments in relation to accountability, cost analysis, and program design.

10. The cost analysis of health occupations education as it relates to program design (e.g., advanced placement, clinical competence, inactive or foreign practitioners, or learners with special needs), program efficiency (e.g., shortened curriculum and fewer clinical hours), and program effectiveness (e.g., length of orientation to levels of practice in meeting role expectations) should have continuous and sustained research focus.

11. There are more applications for health occupations programs than the educational system can accommodate. The use of controlled admissions to health occupations education programs and the relationship of predictors to on-the-job performance has not been demonstrated. Similarly, admission of learners in risk categories, the effect on student performance during the program, attrition, and job performance after program completion need to have a research focus.

12. Predictors for clinical performance, the values of work experience under cooperative education, and the modes of occupational expectations need to be studied in relation to the ability of the program design to prepare clinically competent and safe entry level practitioners.

13. As student leadership activities become part of the curriculum which is planned, implemented, and evaluated, the relationship between the degree of commitment to the student leadership organization and levels of leadership in health occupations should be studied.

14. Teacher education programs need to respond to role expectations of teachers in relation to diagnosing learning needs and in terms of desired competencies, the learning styles of learners, prescriptive learning, curriculum materials, and evaluating for educational gains. All of the roles of teachers in relation to these competencies have implications for research.

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